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ENGAGEMENT IN MOBILE ROLE-PLAYING GAMES

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Abstract:

The purpose of this thesis is to examine which elements make role-playing video games (RPG) engaging, and how these elements could be incorporated into an RPG specifically designed for mobile platforms. Mobile games are generally simpler than computer or console games due to hardware limitations. As such, not all elements of computer or console RPGs may be possible to implement in a mobile game.

Since there is no common definition as to what the word engagement means, this thesis defines it as an umbrella term for positive feelings such as fun, enjoyment, flow and immersion. A literature review found that the most commonly identified engaging factors was challenge/difficulty, followed by visuals, control, social interaction, character, story, goals and adventure. These elements were incorporated into a mobile RPG called Wither, which was developed for this thesis using the Unity game development platform. Wither is built with a standard RPG structure in mind, including a fantasy-themed story and 2D setting, combat, an explorable open world and multiplayer support. A more unique addition is an "exercise mode", which rewards players for getting active in order to encourage breaks between play sessions.

A test group of twenty survey participants were divided into pairs and asked to play the game for a day, after which they answered the Game Experience Questionnaire (GExQ). The GExQ consists of several statements about the participants' feelings of the game, which the participants had to rate on a scale from zero to four. Open-ended questions were added to gather data more specific to the purpose of this thesis. The participants rated the game high on most positive measurements of the questionnaire and low on the negative measurements, indicating that they found the game mostly engaging. The engaging aspects were mostly rated in unison with what was identifies in previous research, with challenge being ranked the players' top one favorite aspect of Wither the most often. The challenge measurement of the GExQ was also the most diffuse measurement according to participants' comments afterward, which could have affected their ratings of it. Overall, due to the small number of survey respondents, there is a chance that some of the correlations found in the survey are just random. The results should be verified with a larger sample size.

Despite not being able to measure which elements in the game specifically made it engaging, it can be concluded that the factors identified in the literature review can be modified for a mobile game, and a mobile game with these elements can be found enjoyable. Future research could study which elements make specifically mobile platform RPGs enjoyable to further specify what mobile RPG designers should keep in mind versus console or computer RPG designers, and to which extent the specific way the engaging elements are implemented impacts on a player's experience.

Keywords: Mobile game, role-playing game, engagement, immersion, flow, game experience questionnaire, player experience	
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1 INTRODUCTION

The video game industry has for long been a very lucrative business. Console and PC games have been around for a while and show no signs of disappearing from the market. However, in recent times, a new generation of games has emerged – namely mobile games.

Not only has the mobile game industry headed off to a booming growth after smartphones, especially Apple's iPhone, were introduced – it is still growing rapidly after 11 years, and has even surpassed the revenues of console and PC games for the first time ever in 2016 (Chan 2017). Even some leading PC and console companies are shifting toward developing mobile applications to either support their established brands, or to create completely new ones.

My personal interest in video games started when I was just a few years old. I began with simple educational games that taught how to read, spell and count, and slowly shifted to "just for fun" games. The Pokémon games on the handheld GameBoy console started my interest in the RPG genre, which slowly evolved into an interest in Massively Multiplayer Online RPGs (MMORPGs) on the PC. At some point I also started planning my own games but lacked the skills to develop one.

It was not until the very recent years that I discovered that mobile games were not all simple puzzle games like Candy Crush Saga. The successful augmented reality mobile game Pokémon Go was an important eye-opener, but what hit the closest to home was finding that one of my favorite console developers had made mobile titles as an addition to an existing console game series. This experience reignited my desire to develop my own game, a game that I wanted to be as complex and fun as my favorite PC game titles, but for a mobile platform. By now my studies had provided me the necessary programming skills to try my hand at making a game. This goal eventually led to me choosing to develop a mobile game for my thesis.

1.1 Aim

The aim of the thesis is to develop parts of a mobile game, incorporating elements that are found in the literature study to be engaging and fun. Mobile games are usually simple,

due to limited screen space and usually not as effective hardware, so the study aims to create an RPG and see if more complex elements from PC and console games can work in a mobile environment.

The literature study aims to narrow down elements that could be incorporated into the game, while the practical part aims to incorporate these and observe if the resulting demo game is perceived as engaging.

1.2 Research questions

I have chosen to research the following questions:

1. What elements make an RPG video game engaging?

2. How can these engaging elements be incorporated in a mobile game?

1.3 Method

The first part of the thesis is based on a literature study to see what has been researched about role-playing games, mobile games as well as engagement in games. For the case study part of the thesis, I have developed a demo version of a more extensive mobile game to-be, which has been tested by a test group to study how engagement in mobile games works in practice. All participants in the test group then filled in a questionnaire about engagement after their gaming session. The method of the survey has been described more in detail in chapter 6. Lastly, the questionnaire results have been analyzed, and the results are discussed in the last chapter.

2 ROLE-PLAYING GAMES

2.1 General

This chapter explores what a role-playing game is, since the game developed for this thesis is a fairly typical example of the RPG genre. This chapter will examine how RPGs have become what they are today and look at common characteristics of RPGs.

Despite being a large genre within computer gaming, the history of role-playing games reaches back to the pre-computer game eras of war games and tabletop games. Even if tabletop games appeared on the market before console role playing games, tabletop games are not a dead genre. Some PC titles have been turned into tabletop games later on, such as the famous massively-multiplayer online role-playing game (MMORPG) World of Warcraft (http://www.warcraftrpg.com).

The term RPG usually refers to all forms of role-playing games, not just the genre within video games. In the context of this thesis it will be used to refer specifically to the video game genre, unless stated otherwise.

2.2 RPGs then and now

The concept of role-playing games is not a new one. The oldest non-computer RPG still played to date is Schlaraffia, which was developed in 1859 (Dittmar 2018). From there, the RPG genre has branched out into different subgenres in the past 150 years. Schalaraffia, for example, is purely a LARP – live-action role-playing game – where the players themselves are acting as their characters in the game (Salen and Zimmerman 2013).

The evolution of modern RPGs could be seen to have started from war games, evolving from there first into tabletop role-playing games and then into role-playing video games (Salen and Zimmerman 2013).

It is difficult to give a straight definition of what a war game is, both because it can cover such a broad spectrum of games, and because the genre itself has evolved over the course of hundreds of years. In general, war games can be narrowed down to contain three

different properties: war, game and simulation. The war aspect implies that the game simulates war or uses military vocabulary, but does not have to do so literally – even chess can be considered a war game, as the game contains elements of war, such as using strategy and an army with different roles to beat the opponent. The game aspect comes from the war game being a game instead of actual warfare. The simulation aspect implies that war games are meant to simulate the conditions of a real war. Because of this reason, war games have historically been used to train the military to perform better in war, and the better the simulation in the game, the better it would educate a soldier (University of Virginia 1999).

Over time, the players of the war games experimented with variations in rules and ways to play the games, and came up with variations that only ended in chaos from a gameplay perspective. Playing the game became more about fun than achieving a goal. This development might have sparked the idea of developing games purely for fun, i.e. role-playing games (Mason 2012).

In 1974, the first Dungeons and Dragons (D&D) tabletop game was launched. While war games usually stayed loyal to depicting real historical events, D&D started exploring imaginary medieval settings. The original D&D game was still considered a war game, having been developed by a war game publisher. The creation of D&D fueled the emergence of role-playing games even further, as the first edition of the game was incomplete, forcing players to invent their own rules and further develop the game on their own. Even after the publication of D&D, the evolution of role-playing games continued as primarily player-fueled, with fans of existing games inspiring commercially launched games with their ideas (Mason 2012).

Only a few years after the first edition of D&D was released, the first digital role-playing games emerged. Some games had already been developed earlier, but it was not until the late 1970s that video games in general had a breakthrough with the introduction of game consoles. Even the first online multiplayer games had been created at this point, hosted on the PLATO educational framework of American universities in secret by students (Pepe 2018).

At the end of the 1970s, the first RPG games were released for computers. In spite of not being graphical in the sense of games today, the game developers utilized what

technology was available to create the visuals. A game could, for example, consist of a maze shown from a top-down view, with different letters or symbols depicting items or enemies. Maze-like dungeons were a recurring theme and gameplay setting in many games, even so much that a new subcategory of RPGs was introduced – Dungeon RPGs. The trend of including dungeons in RPGs of different kinds continues to this date (Pepe 2018).

Over the following decades, several games introduced completely new elements into the genre, spawning new ideas and directions for games. The early 1980s game *Rogue* inspired an entire subgenre of RPG games, "roguelike games", derived from the title of the original. The defining element of Rogue was the introduction of randomizing, meaning that the game would be different every time the player restarted it, allowing the game to stay longer for fun. The game Ultima, released in the late 1980s, changed the concept of an RPG being primarily dungeon-based, and introduced a large world to explore. Educational games also date as far back as to the 80s, with game developer Stuart Smith as an example. Smith only developed games that were educational in one way or another, for example by letting the non-player characters in the games teach the player about real historical facts, showing that games could be useful as well as fun (Pepe 2018).

The 90s introduced several new genres, such as Japanese RPGs (JRPG). Some defining characteristics for 90s RPGs were bright colors and character creation offering a multitude of choices for customization. Graphics improved, giving players a more immersive experience, first with VGA graphics, which made the jump from 16 colors to 256, and even seeing the introduction of 3D games. Games started seeing many more of the features ever-present in video game RPGs today – such as an immersive story, a large world to explore, a wide range of quests to complete, dialogue and strategic combat – becoming more complex and taking longer to complete than before. Real-time combat started making a more prominent entrance where most games had been turn-based before. Cutscenes started appearing more, having previously been at the start and end of the game, now also popping up at important plot points mid-game. Open-world games became even larger with more features. So-called "modding" was introduced, allowing players to edit existing games and introduce new features, similar to tabletop RPGs before. By the end of the 90s 3D graphics truly started to rule the genre, and with more widely available Internet, true MMORPGs emerged. Traditional fantasy RPGs with

knights and wizards and such saw a decline in popularity, with other themes such as Sci-Fi emerging (Pepe 2018).

The 2000's marked the start of modern RPGs. A rising trend, with Internet being present in nearly every household at this point, was so-called "casual" games, aimed toward people who might not have played games before or who are not able to spend hundreds of hours mastering a game. Some games, such as *Diablo II*, were developed to cater both to casual and hardcore players. The standard RPG was almost expected to contain large explorable worlds with hidden secrets and a plethora of content to do. Players of MMORPGs saw the introduction of long-term goals. (Pepe 2018). Game graphics have constantly kept improving, and combined with technical advancements such as 3D monitors and even virtual reality headsets create even more immersive experiences for players.

2.3 Characteristics

In the previous chapter, Pepe (2018) listed some of the characteristics that have been prevalent for up to decades in RPGs, including dungeons, a large world to explore, customization options, story, quests, dialogue, combat, cutscenes and long-term goals for online games.

Sherry (2013) identifies that the RPG genre is characterized by complex and diverse puzzle solving, as opposed to e.g. puzzle games, which have clear objectives and patterns. Prensky (2001) listed some of the general characteristics of the game to be a medieval theme, including a protagonist with a type associated to it, such as elf or wizard, and being able to acquire equipment and experience through battles. An online component was also noted to be a frequently included aspect in modern RPGs.

Ernest (2014) defines the core parts of an RPG to be story and character growth. Other components usually present are combat, tactical and exploration challenges, trading and gathering loot to improve the character's equipment and puzzles. RPGs are noted to contain many elements from other elements but are usually presented in another way than in their main genre. For example, newer RPGs often include combat elements from action-genre games while older games tend to be turn-based, or they might include combat challenges, which are seldom as challenging as in fighting-genre games.

2.4 Summary

Even with Computer RPGs having been around since the 1970s, the core concepts of these games still remain, taking new forms as technology improves and their target audience grows.

The most essential parts of RPGs have been identified to be puzzles or challenges, story, and a fantasy-themed character. Other components vary on the type of game, and older games often have slightly different components than newer games. Different types of RPGs also have different kinds of content, as there are differences e.g. in how an MMORPG and a single-player RPG are developed and played.

The RPG genre will most likely still see huge developments as technology advances and allows for new features such as augmented reality and even virtual reality.

3 MOBILE GAMING

3.1 General

Due to the mobile platform being the focus platform of this thesis, this chapter will introduce some background as to what makes mobile games different from console and PC games. First, there is a brief overview of what mobile gaming is, then some history of what mobile games have been and how they have come to what they are now. Next, some exploration of what types of mobile game genres are most prevalent today, and what differentiates mobile games from console games. Lastly, we will look a bit at mobile game business models, as these differ from other game business models, as well as impact on mobile game design. The chapter concludes with a summary.

Mobile gaming is defined as playing on a portable device, such as a mobile phone or a tablet (Yamaguchi et al. 2017). There are currently three main types of games on the market: PC games, console games, and mobile games. With the evolution of smart phones, mobile games have seen a large surge in popularity, but are nonetheless predicted to co-exist with other types of games at least for a while (Yamaguchi et al. 2017). Some large PC and console developers have started creating mobile games as either standalone games or to support their main franchise. Examples of these are the developers of the Final Fantasy game series, Square Enix, who has later developed mobile games set in the same universe as previous console-made Final Fantasy titles (Square Enix Co. Ltd. 2015), as well as Blizzard, who launched the card game Hearthstone both on PC and tablets back-to-back (Zeriyah 2014a; Zeriyah 2014b). Square Enix has also re-released old console titles as near exact copies optimized for mobile platforms (Square Enix Co. Ltd. 2012).

3.2 Mobile games then and now

Mobile games have been around for as long as there have been mobile phones with large enough displays, with a true market for them emerging in 2002. These games were usually short and meant to be played through in one play session, with average play time being around thirty minutes (Feijoo et al. 2012). In addition to having little content, the first mobile games used to be simple graphic-wise due to lack of processing power, primitive

graphics, and lack of storage. One example is the popular game Snake 2 on the 2000's Nokia 3310 phone model, which was in back-and-white 2D graphics (GSMArena n.d.).

The introduction of Apple's smartphone iPhone in 2007 was what finally triggered the emergence of more serious games on phones (Keogh 2016). The concept of more complex on games on mobile phones had already been teased in 2006 by Nokia, but the attempt failed to break through properly (Feijoo et al. 2012).

With iPhone entering the market, platform-specific application emerged alongside, making it easier to distribute games. In just a year, the mobile game market completely shifted from being the hands of mobile operators to application stores. Developers became able to publish their games directly instead of going through operators, exponentially increasing the amount of mobile games available. In 2010, approximately 2000 new mobile games were added to the Apple application store each month (Feijoo et al. 2012).

Smartphones removed the limitations of not having a good enough display or good enough specifications for bigger games, and the emergence of 3G connection allowed mobile games to be played online. The increase in mobile phone storage capacity has allowed games to use more complex assets, and the built in features of the phones, such as gyroscope, have allowed game developers to experiment with innovative controls, due to the lack of screen space (Feijoo et al. 2012).

3.3 What differentiates mobile games from console games?

Players enjoy different things and seek out different emotions when playing mobile games versus traditional console games. The demographics are also different for mobile games, indicating that there has to be elements separating mobile games from other games, despite both being games.

The most noticeable characteristic of a mobile game is that they have simple user interface, imposed by the limitations that the small screen of a smart phone provides. Even though smart phone screens have grown larger since their release, they are still nearly not as large to fit all the information of a computer monitor or even a tablet. Nowadays most smartphones are sophisticated enough to render 3D imagery, and can

even run some of the same games that are available on PC or for consoles. Phone specs are improving every year, allowing for more and more complex games as well as new features such as motion tracking and gyroscope that game developers can utilize. There are even smart phones in the market specifically marketed as gaming phones, with specifications optimized for a good gaming experience (Razer Inc. 2017).

Despite the limitation of screen size, mobiles have their own advantages compared to PCs, their main advantage being that they are portable. Mobile games fill a niche of being able to play games on the go, opening up the gaming scene for a wider demographic than traditional PC or console games. The built-in features of smart phones also allow for novel game mechanics, such as augmented reality. For example, Pokémon Go shows the player's avatar on a real map of the area where the player physically is, and as the player walks in the real world, Pokémon will appear on the map shown in the application. The player will have to move to the location of the Pokémon in the real world to be able to catch them (Niantic 2016). On the other hand, no matter how sophisticated the technology of a mobile game is, a player would not keep playing if the game itself did not meet their personal preferences (Choi and Kim 2004).

Despite handheld consoles such as the Gameboy or PlayStation Portable having been available before, smartphones have the advantage that most people nowadays, at least in the developed countries, have one, making it easier for developers to reach a wider target audience. The limitations of the old handheld console games still apply in that not all smartphones use the same operating system, meaning that not all games will be available for all platforms unless a developer chooses to Smart phones were noted to have some effect on substituting for handheld consoles, but not for non-portable consoles. (Yamaguchi et al. 2017).

J. Merikivi et al. (2017) studied why people play mobile games and found that the enjoyment gotten from the experience itself was the driving factor. Liang & Yeh (2011) and Choi & Kim (2004) similarly noted that when players enjoyed playing a game, they were more likely to keep playing.

Features in mobile games that are attractive to players are ease-of-use (Merikivi, Tuunainen, and Nguyen 2017; Park and Kim 2013; Ntina, Ma, and Deng 2013),which is positively influenced by graphics, animation and sound (Park and Kim 2013) as well as

frequently introduced new content (Merikivi, Tuunainen, and Nguyen 2017). Graphics were found to directly enhance player enjoyment by Liang and Yeh (2011), but contrary to the other authors, they did not find that ease-of-use would have an impact on enjoyment. Liang and Yeh also observed that ease-of-use did instead have an impact on the user's intention to play a game.

Multiplayer gaming option, 3D graphics and more long-term play were identified as features of mobile games that mobile players want to be included (Ntina, Ma, and Deng 2013). The same study found that in multiplayer mobile games, despite the user interface not leaving room for extensive messaging systems, an in-game messaging option was preferred as a way of communication as opposed to forcing players to use external communication methods.

Challenge in mobile games was found to not be as important as in other platforms, perhaps due to how mobile games are often played on-the-go, and the player's attention needs to partially be on the environment and not entirely on the game (Merikivi, Tuunainen, and Nguyen 2017). Even though players enjoy fast-paced progression, they did not want progression to alter the game controls or the interface too dramatically (Merikivi, Tuunainen, and Nguyen 2017).

Even when it comes to non-casual mobile games, Keogh (2016) argues that there are casual design elements in every non-casual mobile game due to the context in which mobile games are played and the limitations of the platform they are developed for. Turn-based combat in a non-casual game, as an example, is a feature that allows the player to pay focus to their surroundings, while the genre is generally regarded as requiring more attention than casual games.

3.4 Business models

Along with mobile games, many new business models have emerged, making an impact on how games are designed to accommodate the new ways of monetization.

One of the reasons why mobile games have gained so much traction could be due to the fact that most of them are free to download. Even so, few games are truly free despite being free to download, as developers need to generate revenue in some way. The

freemium model has become a lot more prevalent with the introduction of mobile games, and they often generate revenue in the form of microtransactions, where the player pays some amount of money to buy in-game items, currency or other things. Despite the name "microtransaction" by definition meaning to pay "a very small amount of money" (Cambridge University Press 2014), some developers are stretching it to include payments of up to $100. Microtransactions have even become popular in other platforms than mobile devices (Makuch 2018). The freemium model has seen additions of "cash shops" into games, either in the form of offering mainly cosmetic boosts or items that could be purchased in order to progress faster.

Despite the popularity of the freemium model in games, many players were found to not continue playing a game in case they had to pay to be able to progress (Merikivi, Tuunainen, and Nguyen 2017).

Another new form of generating revenue are ad-based games, also called advergames (Feijoo et al. 2012), where the game contains advertisements in some form. Sometimes these can be removed by purchasing a subscription for the game, or they can be included as a part of the gameplay. Wokamon, a virtual pet caring mobile game, for example, allows the player to gain extra rewards for his or her pet by watching ads – but doing so is completely voluntary (Noodum 2015). Another example is the adventure game Dungeon X Dungeon, where the point of the game is to avoid traps, and upon failing, an advertisement will play (PLAYONE 2018). The game provides the opportunity to avoid ads by becoming skilled at the game.

Park and Kim (2013) found that for a game to become successful, an even more important factor than the technical implementation of the game was marketing. With the abundance of mobile games on the market, it is natural that the ones that are widely marketed have a higher chance of attracting any players than a game that no one knows of. The chance of randomly stumbling upon a game that meets your preferences is not very high, and no matter how good your game is, if no one knows about it, it cannot succeed.

Moreover, it matters when the game is marketed in relation to its lifecycle. The highest chance of success is right after the game is released, after which the effectiveness of marketing goes down with time. However, if a game succeeded in holding a top position in an application download platform for a certain time, the chances to drop down from

the top list would decline over time, leading to some games being able to hold their top positions possibly even for months, due to players being very likely to try out the most popular games (Yi, Lee, and Kim 2017).

3.5 Summary

Despite the huge increase in popularity for mobile games, they do not seem to become the dominating platform for games, at least in the foreseeable future. Smartphones were the enablers for a true mobile game market, which nowadays has overtaken the console and computer game market, due to different factors that differentiate mobile games from other types of games.

The technology today is sophisticated enough to run 3D imagery and enables the development of games with enough content that can allow hundreds of hours of gameplay. Mobile phones are usually carried everywhere, leading to easily accessible gaming moments, and mobile games are often designed to support being played in short sprouts here and there. The small screen size is a challenge for developers to overcome, but also forces innovative design of games and can result in fun and different ways to game. New business models have emerged to accommodate for the differences in mobile games versus console games, such as freemium and advergaming. With the prevalence of free games to download, there is a much larger threshold for players to actually pay for access to a mobile game, let alone pay a larger sum such as for computer games. This means that offering a game for free is no longer as efficient a tactic to lure in customers. Game developers have to put effort into marketing in order to differentiate themselves from the thousands of other free games available.

4 ENGAGEMENT IN GAMES

4.1 Definitions

As the thesis aims to look at which elements in a game contribute to an engaging or positive experience for players of role-playing games, this chapter will examine what literature defines as terms related to these subjective feelings. First, we will have a look at what the literature says about the definition of the positive feelings of playing a game. Then we will look at concepts relating to research about engagement in games. Lastly, we will examine what previous research has concluded about achieving player engagement and positive emotions in a game.

The most common words associated with a positive experience in the reviewed literature were engagement, immersion and flow. Other words also used were presence, engrossment, attention and psychological absorption. Wirth et al. (2007) further noted that there is no consensus as to what word would best describe the player's experience of a game. Therefore, we will examine the literature definitions to determine which words will be used for the context of this thesis.

4.1.1 Engagement

Mallon and Lynch (2014) define engagement as the feelings of involvement, enjoyment and pleasure. Some alternative terms, that are sometimes used interchangeably, include interest, involvement, immersion, presence, flow and psychological absorption. The authors see these terms more as the prerequisites for achieving a state of engagement rather than true synonyms.

Slater and Wilbur (1997) propose engagement, in a gaming context, to be the degree to which the user forms a connection to a game and their willingness to keep playing the game.

Brockmyer et al. (2009) define that the different stages of engagement are presence, flow and absorption. Laffan et al. (2016) also define flow as a component of engagement, and that engagement relates to feelings of happiness.

Stuart (2001), on the contrary, concludes that all concepts related to engagement, such as immersion and involvement, are subattributes of presence.

4.1.2 Immersion

Brown (2004) conducted a survey to study how players themselves defined immersion. It was concluded that immersion described the "degree of involvement with a game", with three different levels identified – engagement, engrossment and total immersion. Engagement was in this study determined to be the lowest level of immersion, which is achieved once the player has overcome the threshold of starting to play a game and has decided to invest time in it. The player then transitions into the phase of engrossment if the game influences the player's emotions positively. The final stage of total immersion is reached when players are able to lose themselves in the game. This transition happens if the player feels empathy toward the game characters and perceives the in-game world as realistic.

Slater and Wilbur (1997) define immersion as the feeling of being part of the game world, to such an extent that the player eventually forgets the real world around him or her.

Immersion can also be defined as the player feeling like actually being in the game world, not just acknowledging that the character is inside the game world (Baños et al. 2004).

4.1.3 Flow

According to Lazzaro (2004), when seen from a gaming perspective, flow is a state where the player forgets to focus on anything else but the game. Track of time is lost, where the player can feel the time both speed up at times and slow down at times. The state of flow itself does not feel fun or enjoyable, but the positive feelings usually come after leaving the state. Flow is created by completely grabbing the player's attention e.g. with a difficult task that has a clear and achievable goal.

Flow can include a feeling of being one with the activity conducted and losing track of time. It is seen as a deeper feeling than immersion, and therefore less common to achieve (Brockmyer et al. 2009).

Su et al. (2016a) found that concentration is an important attribute for achieving a state of flow as well as perceived enjoyment of the game, indicating that there has to be some kind of enjoyment of the game before flow can be achieved.

4.1.4 Terminology used in this study

Engagement was directly linked to positive feelings and encompassed a wide variety of other terms as either synonyms or components of it, depending on the research. Therefore, engagement was selected as the umbrella term to describe the player's experience in this thesis. All the other terms will be seen as sub-components, which contribute to forming the full experience of engagement.

Fun, while not mentioned in detail in any of the reviewed sources, was considered too limiting a concept for this thesis, as a game can bring positive feelings to a player without only being fun. A game will also most likely not always be fun, but a player can still keep playing the game.

Flow and immersion were concluded to not encompass engagement directly, but were deemed more as components that will lead to engagement. A game will usually feel engaging when achieving a state of flow or immersion, but a state of flow or immersion will not necessarily lead to feelings of engagement.

4.2 Research fields

Throughout the history of software and games, different fields of research have been utilized to figure out how to make software that will attract users and make users want to keep using the software.

One term to describe the theory of player engagement and satisfaction, or experience, is Player Experience (PE). PE is derived from the more commonly and broadly used concept of User Experience. While User Experience focuses more broadly on how the user perceives his or her interaction with it, and the usability of IT, PE is focused specifically on the user's experience and enjoyment of games (Wiemeyer et al. 2016).

4.2.1 Usability

The base for the concept of user experience is usability. The user's satisfaction and experience with using consumer IT goods has long been important to developers. In 1998, the International Organization for Standardization (ISO) released the ISO 9241-11 standard, concerning usability of computer equipment and software. The ISO standard defines usability as "[The] Extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" (ISO 1998).

4.2.2 User experience (UX)

Usability lacked one important part of the user's experience with consumer products: enjoyment. A new term with a broader meaning called user experience (UX) thus evolved (Wiemeyer et al. 2016).

ISO updated its standards in 2010 to be even more user centered. The old ISO 13407 was reworked into a new ISO 9241-210, which focuses on human-centered design. The standard defines user experience as the following:

" Person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service.
Note 1 to entry: User experience includes all the users' emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviours and accomplishments that occur before, during and after use.
Note 2 to entry: User experience is a consequence of brand image, presentation, functionality, system performance, interactive behaviour and assistive capabilities of the interactive system, the user's internal and physical state resulting from prior experiences, attitudes, skills and personality, and the context of use.
Note 3 to entry: Usability, when interpreted from the perspective of the users' personal goals, can include the kind of perceptual and emotional aspects typically associated with user experience. Usability criteria can be used to assess aspects of user experience." (ISO 2010).

Usability is noted to be a part of user experience, as it was determined to be an important part of the user's experience, but no longer the only important measurement.

4.2.3 Player experience (PE)

The most important concept for this thesis is player experience (PE). PE is derived from user experience, referring to the same concepts, except that they are applied to a gaming context. There is no general consensus yet as to how to define PE, but psychological, behavioral and physiological models can be used to try to form a definition for the concept (Wiemeyer et al. 2016).

Nacke et al. (2009) propose that Player Experience is about studying the interaction between the player and the game, in contrary to playability, which is the relation between the game and the design of the game. The authors also argue that good playability in a game is a prerequisite for good player experience.

Some of the most studied experiences of PE are immersion, tension, challenge, curiosity and positive and negative emotions. Methods to study PE include physiological methods, psychological methods and behavioral methods (Wiemeyer et al. 2016). Surveys are one form of psychological methods, and are noted by Wiemeyer et al. to be one of the easiest methods of studying player experience, which is also why surveys were used to gather data for this thesis.

Nacke et al. suggest that PE should be measured with several variables rather than with a single approach. They recommend observing reflective (subjectively controllable) and reflexive (objective and uncontrollable) responses in the player, and to study the sensitivity, reliability and validity of the responses.

4.2.4 Games user research (GUR)

Games user research is a wider term referencing to all aspects of game development theories and research, which includes fields such as playability and the aforementioned player experience and user experience (Wiemeyer et al. 2016).

4.3 Factors contributing to the enjoyment of a game

Previous studies have been conducted to find out factors contributing to or making up player enjoyment in games. Enjoyment in this context has been concluded to be closely

related to fun, flow, immersion, and engagement, so this literature review has reviewed sources analyzing any of these terms.

4.3.1 The four keys of fun

One study about which factors combined make up a fun game will be examined more closely, due to them creating an understanding about what factors the game in whole should include to be considered to be fun, instead of studying the effect of single factors, or not studying the factors themselves in detail.

Lazzaro (2004) narrowed down four keys as to why players had good experiences of a game. The "easy fun" key of the study focuses primarily on immersion and player attention, and what contributes to it, while "hard fun" also partially includes a state of flow. Summarized, the four keys are:

- Internal experience: The game makes the player experience positive emotions, such as excitement, and generally makes them feel different than when not playing. For example, if they were bored before, they are no longer while playing, or they feel like they are good at something. The internal experience can be generated or enhanced e.g. by interesting visuals, stimulating audio effects or startling events that create an adrenaline rush.
- Hard fun: The game offers challenges that the player feels good about beating, especially if it requires strategy instead of being lucky or being able to breeze through. Flow can also be achieved from hard fun when the game provides the player with elements such as clear goals, achievable tasks and a sense of control. Although the game should be challenging, difficulty should be well balanced. However, tough challenges that feel frustrating to the player can make the player feel even stronger positive emotions when finally overcoming the challenge.
- Easy fun: The game induces immersion in the player, for example by offering excitement and adventure, mystery so that the player wants to find out what happens next, and good sound or visual effects to make the player feel curiosity, and really want to focus their attention on the game. Creating the correct atmosphere in the game is an important part to achieve this aspect.
- Social experience: Players like to share their experiences with others and to play together, either separate games but in the same space, or a multiplayer game with

both playing with each other in the game itself. Some players find that the people they play with are more important than the game itself. It was also noted that playing socially amplified a player's emotions compared to playing alone.

Lazzaro notes that out of these four keys, at least three have been present in many best-selling games. Lazzaro further argues that emotions play such an important part in decision making that it is important for games to induce emotions in players, as then they are more satisfying for players and the players are more likely to start playing.

The other factors identified in the literature study are largely in line with Lazzaro's findings. The following sections will detail the other findings.

4.3.2 Goals

A study by Choi and Kim (2004) noted that players would remain loyal to online games if the game provided them personal interaction. Personal interaction includes giving the player goals and rewarding them when achieving them, especially if the goals were challenging.

Short term goals were found by Malone (1980) to be preferred by players over long-term goals. The goals should preferably be clearly stated, with known ways how to achieve them, instead of more abstract goals where the player can freely choose how to complete them. The same was found by Whitton (2011), He (2017), Jegers (2009), Jo et al. (2009) and Prensky (2001).

4.3.3 Social interaction

Most of the studies investigating the role of social interaction in games have concluded that it is an important element of games. Colwell (2007) states that social interaction was one of the most important reasons for players to play games in general.

Choi and Kim (2004) identified that providing social interaction, e.g. by giving players tools to interact with other players, would make players keep playing online games longer. Su et al. (2016b) noted that social interaction, especially player to player inside the game, was found to improve focus on the game and perceived enjoyment. Like Lazzaro found in the four keys of fun, Bowman et al. (2015) confirm that people enjoy a game more when they play it with others instead of playing alone.

While the previously mentioned studies identified social interaction on a more general level, authors such as Weibel et al. (2008) specify elements that affect the enjoyment of the social aspect. Weibel et al. found that playing against players makes the game more enjoyable than playing against NPCs. Likewise, Tychsen et al. (2008) found that the more there was communication and coordination in group play in an online RPG, the more the players enjoyed the game. Laffan et al. (2016) identified that social interaction contributed to flow.

However, one contradiction was found by Jegers (2009), whose study suggested that social interaction was not an important part of the game tested in the study. It was proposed that the result could be due to the limited social capabilities of the game, indicating that games that are purely designed to be played by a single player might not benefit much from playing with company.

4.3.4 Challenge and difficulty

The need for challenge is a top motivator for players to choose a game according to studies conducted by Lucas and Sherry (2004) and Colwell (2007).

Challenge in games is not only about difficulty, but also about increasing player competence. Su et al (2016b) and Mallon and Lynch (2014) found that challenging games and difficult games are more likely to make a player engaged. The game should not only be challenging, but help the player become skilled at the game by teaching the mechanics Federoff (2002). The more skillful and competent a player perceived him- or herself as, the more immersed the player would get (Wirth et al. 2013; Takatalo et al. 2010; Takatalo et al. 2018). Laffan et al. (2016) suggested that a game could be made more challenging by adding punishing features, such as losing a life when dying.

While the game should be challenging, the level of difficulty should not be constant throughout the game (Jo et al. 2009). Regulating it in a down-up fashion, where the difficulty first gets easier and then more difficult, was found fun, while the inverse with an up-down difficulty or a continuously same level of difficulty were found frustrating or boring (Qin et al. 2009). Prensky's (2001) study finds that a game should be easy at the beginning. Bostan (2009) suggests to balance the difficulty curve in a more curved fashion instead of linear, so that the beginning is very easy, and then slowly starts to get

more and more difficult toward the end. Moreover, developers should make sure that the player is always at an optimal level of challenge.

Amigo and Larsson (2015) note that very difficult challenges can be frustrating rather than fun. In these cases, they recommend designing games where the player is warned in advance that there will be exceptionally difficult challenges, and the player still has to feel somewhat in control over the game. They also found that there had to be more relaxed parts in between the challenges to allow the player to progress their character without constant stress.

Bouchard (2010), in contrary, found that the difficulty of the challenge does not necessarily matter, if the player has the freedom to choose the difficulty level themselves.

4.3.5 Visuals

As technology has advanced and allowed visuals to be more realistic, they have become a focus point in game development. Visuals nowadays make up a large part of the budget for AAA games (Pepe 2018).

The visuals of a game were found to influence the player's experience positively by Mallon and Lynch (2014), He (2017), Wiebe (2014), Federoff (2002), Jegers (2009) and Jo et al. (2009).

The nature of the graphics was not fully agreed on by researchers. Bailenson et al (2005) and Laffan et al. (2016) found that realistic, state-of-the-art graphics would enhance gameplay and allow the player to immerse him- or herself in the game. Martey et al. (2014) noted that complex art might increase engagement in games, but only when combined with a complex narrative. Otherwise it was seen to lower engagement. Prensky (2001) concluded that good visuals are important for a game and can be used to attract players, but aesthetically pleasing visuals do not compensate for lacking gameplay. A game whose only good feature are the impressive visuals will not be fun to play in the long run. In fact, Prensky argues that a game can be fun even without high-tech visuals, mentioning Tetris as an example.

Less realism was found by Wolf (2013) and Shaw (2010) to be better, as it allows the player to project his or her own imagination into the game.

4.3.6 Adventure and exploration

Since the introduction of free exploration of the in-game world to RPGs, the exploration aspect has remained important. Modern visuals also allow for a more interesting world to be built, further enhancing the experience of exploring the world.

Games offering exploration feel more enjoyable to players (Wirth 2013; He 2017). Wirth notes that exploration is especially important if the player does not feel involved in the tasks that the game offers. Suspense and mystery were also identified as important elements of a game.

Improving the exploration aspect of the game by allowing the player to interact with the game's environment boosted the sense of presence in the game (Bostan 2009; Federoff 2002). Federoff also noted that the game world should be built to feel alive, e.g. by designing it in a fashion that it would feel like a real world whether the player character would be in it or not.

4.3.7 Control

The feeling of being in control over the game has lately become a more highlighted aspect of games. For example, recent games such as Guild Wars 2 have even used freedom of choice as a marketing argument (O'Brien 2012).

Control was found to be an important factor in feeling engaged in a game (Takatalo et al. 2008; Jegers, 2009; Takatalo et al. 2010; Jo et al. 2009). Malone and Lepper (1987) noted that if the player feels in control over the game, engagement is increased. Control can be achieved by letting actions taken by the player result in clear consequences, giving the player a large amount of options and choices as well as making sure there are decisions the player can make to feel powerful or which have a powerful impact on the game. Bostan (2009) also found that giving the player the freedom to play games in a non-linear fashion would make the game more immersive, but giving too much freedom would break the immersion. Federoff (2002) and Jo et al. (2009) suggest that a game should be built around several paths taking the game forward, so that the player is not forced to take any certain path to complete the game. If this is not possible, the fact that there is limited freedom of choice should not be made blatantly obvious.

Klimmt et al (2007) note that as long as the player's actions have consequences on their gameplay the game will feel engaging. Having less control over the game can, however, be fun in case the loss of control is temporary, e.g. a part of the game where the player has to struggle to regain control.

Kim et al. (2015) found that a sense of control significantly improved game enjoyment. They noted that control could be enhanced by allowing customization of a variety of aspects of the game – not just of the character.

Calvillo-Gámez et al (2010) identified that ownership is one of the factors leading to enjoyment in a game. Ownership can be achieved by feeling in control of the game. If the game does not provide the player enough control over his or her gameplay, ownership can be obtained by having previous experiences with similar games, by spending time playing the game, or if the game provides pleasing aesthetic values. Tychsen et al. (2008) also noted the link between enjoyment and having played similar games before.

4.3.8 Character

The in-game avatar of the player, the character, is mentioned by several authors as a factor contributing to engagement. A game that has a very simple and aesthetically pleasing interface or mechanics is not always enough to make a game engaging. It can be argued that players who in general play role-playing games are more likely to want some form of character interaction and story, and feel emotional connection to the game, than players who for example play puzzle games like Tetris.

He (2017), Panumate (2015) and Gee (2004) noted that being able to identify with one's own avatar enhanced gameplay. Bailey, Wise & Bolls (2009) noted that providing many options for avatar customization had the same effect. Jo et al. (2009) expanded on this by finding that not only customization of the character appearance, but also customization of character abilities, with features such as power-ups, increased enjoyment. Soutter and Hitchens (2016) found that the more options for customization there are, the stronger the players could feel a state of flow.

Mallon and Lynch (2014) have in particular studied the link between characters in games and player engagement. They have found that focusing on characters instead of plot positively influencing the player's experience, and that in-game relationships are

important. They mention the importance of including player-character relationship attributes such as perceived intelligence in non-player characters, the player being recognized as a protagonist, deep relationships between the player and other characters, several interaction channels with other characters, non-stereotypical characters, non-static relationships, the possibility to build relationships, moral choices and romantic relationships. Summarized, players who form an emotional attachment to the characters of the game are likely to become more engaged.

Tychsen et al. (2008) found that the player should feel a bond to their character to increase the positive experiences of the game. The character does not have to be similar to the player him- or herself, but has to simply be fun to play and easy to control.

4.3.9 Story

Few of the studies examined for this thesis have focused on examining the storyline of games. Even so, story is usually one of the main components of an RPG.

A story-heavy game can increase engagement according to Mott (1999), Schneider et al. (2004) and Jo et al. (2009). Martey et al. (2014) added that including a story would increase engagement in case the story component was not too prevalent in the game. Federoff (2002) noted that all puzzles solved in the game should relate to the story in some way.

He (2017) conducted a survey to players of an educational game and identified four attributes of game storytelling that positively affected player experience. Attributes that contributed were tone, detail, relationships and fantastical story. The tone of the narrative was preferred to be light and more conversational than formal. More detail was found to be better, e.g. by explaining backstory that is not relevant to the actual gameplay. Relationships with the player and NPC's enhanced game enjoyment. The theme was preferred to be realistic with just a small addition of fantasy, in contrast to fully fantastical.

Bouchard (2010) found that players preferred some kind of narrative components instead of none at all.

4.3.10 Other

The previous sections detailed elements which were mentioned by several authors. This chapter details elements which were not as frequently mentioned, but are still noteworthy.

Koster and Wright (2004) note that the game needs to be balanced around providing the player new information to awaken curiosity, but hold back enough so that there is no overabundance of information. Games that no longer provide anything new to learn or understand will become boring.

Takatalo et al. (2008) finds arousal caused by gameplay one aspect that contributes to making the game fun.

Non-complex game controls combined with familiar game objects made a game most fun, compared to complex controls & familiar game, or complex controls and unfamiliar game Li (2014). It was also noted that small displays with large resolutions were preferred by players to enhance immersion. Ivory and Kalyanar (2007) found that technologically more advanced games were more immersive.

Fast progression, including not having to spend a lot of time reading rules was found important for players Whitton (2011). Bouchard (2010) also notes that the speed of progression is important, with the optimal speed depending on which genre of game is in question.

Laffan et al. (2016) noted that games that included reward features and manipulation features could easier get the player into a state of flow.

Christou (2014) argues that positive first impressions of a game makes the game appealing to the player, and appeal leads to immersion.

Sound was found to increase engagement by Mallon and Lynch (2014) and Jo et al. (2009). The sound effects should not be too repetitive, otherwise they can break the immersion (Angela Y. He 2017).

4.4 Summary

Factor	Short description	Studies confirming
Challenge and difficulty	Challenging games should teach the player how to become good at the game in order to be fun. The difficulty should also be adjusted down at the beginning of the game, and increase either in a down-up fashion or curved fashion.	Lazzaro (2004), Su et al (2016b), Mallon and Lynch (2014), Wirth et al (2013), Whitton (2011), Laffan et al. (2016), Qin et al. (2009), Larsson (2015), Jo et al. (2009), Bostan (2009), Prensky (2001), Lucas and Sherry (2004), Colwell (2007), Takatalo et al. (2010), Takatalo et al. (2008), Federoff (2002) and Bouchard (2010)
Visuals	Most studies agree that the visuals should preferably be realistic or complex, especially if accompanied by a complex narrative. Some note that less realistic graphics allows players to use their own imagination more.	Lazzaro (2004), Mallon and Lynch (2014), He (2017), Wiebe (2014), Federoff (2002), Jegers (2009), Jo et al. (2009), Bailenson et al (2005), Laffan et al. (2016), Martey et al. (2014), Prensky (2001), Wolf (2013) and Shaw (2010).
Control	The player likes feeling in control over the game, which can be achieved e.g. by allowing multiple ways for the player to progress	Lazzaro (2004), Takatalo et al. (2008), Jegers (2009), Takatalo et al (2010), Jo et al. (2009), Malone and Lepper (1987), Bostan (2009), Federoff (2002),

	and for the player's actions to affect the game.	Klimmt et al (2007), Kim et al. (2015), Calvillo-Gámez et al (2010) and Tychsen et al. (2008).
Social interaction	Social interaction enhances player experience if there are good tools for interaction with other players. Social interaction can be both playing in the same room with friends or playing online.	Lazzaro (2004), Choi and Kim (2004), Su et al (2016b), Laffan et al. (2016), Bowman et al. (2015), Weibel et al. (2008), Colwell (2007), Jegers (2009) and Tychsen et al. (2008)
Character	Customization of the player avatar is an important feature of games. Players should also be able to relate to and form a connection to their character.	He (2017), Panumate (2015), (2004), Bailey, et al. (2009), Jo et al. (2009), Soutter and Hitchens (2016), Mallon and Lynch (2014) and Tychsen et al. (2008).
Story	The inclusion of a story component was found by most to increase enjoyment of a game, but the degree of which the story should be added in varied.	Mott (1999), Schneider et al. (2004), Jo et al. (2009), Martey et al. (2014), Federoff (2002), He (2017) and Bouchard (2010).
Goals	Goals should be short-term, clearly stated and feel rewarding when completed.	Lazzaro (2004), Choi and Kim (2004), Malone, Whitton (2011), He (2017), Jegers (2009), Jo et al. (2009) and Prensky (2001)

Adventure and exploration	The game should offer a world that feels alive and can be explored, and it should awaken a sense of curiosity in a player.	Lazzaro (2004), Wirth, (2013), He (2017), Bostan (2009) and Federoff (2002)
Other	Other factors mentioned were game controls, technological advancement, speed of progression, reward mechanisms, positive first impressions and sound effects and background music.	Koster and Wright (2004), Takatalo et al. (2008), Li (2014), Ivory and Kalyanar (2007), Whitton (2011). Bouchard (2010), Laffan et al. (2016), Christou (2014), Mallon and Lynch (2014), Jo et al. (2009) and He (2017).

Figure 1: Table summarizing the factors identified in the studies in order of frequency.

The four keys of fun described by Lazarro (2004) summarize well the components needed to make a game that feels fun to the player. The four keys consist of internal experience, hard fun, easy fun and social experience, with most successful games containing at least three components. The importance of these keys is reflected in the fact that they are prevalent in most of the factors identified in the literature study. The top four identified factors by other researchers are components or partial components of the four keys.

The most important factor for enjoyment in almost all studies was challenge and difficulty, reflected in the four keys by “Hard fun”. The game should not be too difficult, as then it will only be frustrating, but challenging in a way that obstacles can be beat through carefully planned strategy instead of luck. Preferably, the game should teach the player to overcome obstacles and give guidance on what kinds of strategies can be utilized. Being the most frequently mentioned factor in studies, it is important for game developers to invest time in balancing the difficulty of the game.

Visuals was the second most mentioned factor, indicating that a game should look pleasing to the player for a player to fully enjoy a game. It was noted that visuals were more of a secondary factor – games could be fun without good visuals, but good visuals would enhance the gaming experience. This aspect was mirrored by the "internal experience" element of the four keys of fun.

Not having control over the game will make a game frustrating, and due to being found as an important factor by many studies, important for game developers to take into consideration when designing game mechanics. The "Hard fun" component of the four keys includes this attribute.

Social interaction is, according to most of the studies examined, including the four keys, important to implement well when a game is supposed to be played socially. Character customization and attributes did not rank very high in this literature survey, but that could also be due to the fact that not all of the studies had focused specifically on RPGs, where the character is one of the most essential elements of the game. Story ranked equally high as the character component, possibly due to the same reasons.

Goals was the last of the factors agreed on by several authors. The "Hard fun" aspect of the four keys does include clear goals as one of the prerequisites to achieve a state of flow within a game. In spite of ranking fairly low, it is difficult to determine whether the absence of goals in a game would significantly lower player engagement or not. Some other elements mentioned were game controls, technological advancement, speed of progression, reward mechanisms, positive first impressions and sound effects.

Exploration and adventure were identified by five studies, ranking lower than the previous factors possibly because not all studies specifically examined games that have an exploration aspect, or at least not in an equally important role as in RPGs. The four keys included this attribute under the umbrella term of "Easy fun", indicating that it could still be an important aspect, especially in making games that offer the exploration component.

5 WITHER

5.1 General description

The game I developed for this thesis is a mobile RPG game with the working title "Wither". Due to time limitations, only a few parts were made for this thesis. There are plans to expand the game in the future to include many more features, and to improve it on basis of the feedback received in the questionnaires that will be presented later in this thesis.

Amateur game designers usually base their games on games they like themselves (Hurel 2016), which also was the case for Wither. Wither is heavily inspired by the original Gameboy Pokémon games as well as the Final Fantasy game series. In its current state, the game features a 2D fantasy setting, turn-based combat, open world exploration and a multiplayer gaming mode. 2D graphics were chosen due to being faster to implement and requiring less processor capacity and memory from the phone.

The game is written in the C# programming language using the Unity platform, and all graphical assets used in the game have been designed and drawn specifically for this game. Unity was chosen due to the wide variety of tools the platform offers for developing games, facilitating the process and making development more accessible to beginners. For example, assets do not have to be manually placed on the scene by setting the coordinates programmatically, but can instead be placed on the scene in Unity's visual interface.

The game utilizes a SQL database to store all information. SQLite is used to maintain the database, and a plugin called SQLite4Unity3d (Huertas 2017) is used to handle all communication between Unity and the database.

Due to Unity's flexible compiling feature, the game can be exported for any screen resolution and to a wide selection of platforms. The game is however optimized for a screen resolution of 1920 x 1980 and the iOS operating system, but has also been tested to work on a wide variety of resolutions and on an Android operating system as well as the iPad.

The game is constructed through different scenes and has seven scenes implemented: Title screen, character selection, character creation, starting open world area, combat, character overview and exercise mode.

Because Wither is primarily thought to be played on mobile screens and not on tablets, user interface elements have been kept to a minimum to not occupy screen space. It is certainly a challenge to design an interface that contains all necessary information, but does not leave room for the actual gameplay, such as seeing the world around the character. Some other design decisions were also made to adapt the game to its mobile context, such as turn-based combat to allow the player to focus attention away from the phone when needed.

The game is targeted toward players who have played RPGs before and know the most basic terminology and abbreviations used in the genre. For example, experience is abbreviated XP instead of writing out the full word, and the player's energy is simply referred to as MP as is typical in RPGs, instead of a more descriptive name. A brief tutorial is held when a player creates a new character to introduce the, but because the game does not feature any difficult real-time elements or mechanics differing from other similar RPGs, no further explanations or guides have been added after this. The test group who have tried the game and answered the survey are people who have played RPGs before, which supported the decision that the game did not need to be user-friendly toward complete beginners.

5.2 Theme and storytelling

Wither is set in a fantasy world, where the premise is that the world is suddenly starting to wither, as the deity who watches over the world is under an unknown distress. The protagonist's task is to find out what is going on and how to stop it. The protagonist is a fair-haired female elf-like character, which the player gets to choose a name for.

The story is mainly told through comic-like storytelling at different points of the game. The player gets to know a bit about the world and the background when starting the game, through a comic or picture book-like experience, where the player flips through pictures on his or her own pace by tapping on the screen. These cutscene-like story sequences

appear throughout the game at significant plot points, and is the primary source of storytelling in the game.

Other ways that the story is presented is through the gameplay itself, with dialog popping up when interacting with other NPCs.

5.3 Basic mechanics

While the objective lore-wise is to save the world, the objective for the player is to defeat enemies to gain experience points from combat. Experience allows the player's character to gain levels when enough experience is accumulated. Leveling the character up makes the character stronger in battle, which is required to progress in the game as enemies get harder the further the player advances. Some features are also locked until the character reaches a certain level.

In addition to leveling up, the character's strength can be improved by acquiring new weapons and armor by defeating enemies. Equipped weapons and armor gain experience after battle, and will level up similar to the character, making the items stronger. Equipment is specific to the character acquiring it. At this moment, the game supports creating up to three characters. Each character has their separate inventories and progress in the game.

The game features an exercise mode for players who enjoy going on walks or runs. During exercise mode, the game tracks the number of steps the player walks, and when the exercise is completed, the player is rewarded with items based on the number of steps accumulated during the workout. This acts as an incentive to go outside, as some of the possible rewards are unique to this game mode and have a very low chance of being obtained. Some other hard-to-obtain items in the rest of the world also have a chance of appearing as rewards, such as boosts that make the player gain larger amounts of experience for a certain amount of time.

The rest of the game cannot be played while exercise mode is active, to make sure the player focuses on his or her surroundings and not only the mobile screen. Steps are tracked even when the application is in the background, and update once the player opens the application again. This helps slow down battery drain as the phone display does not

have to be on while exercising. Closing the application will cause tracking to stop completely.

5.4 The world

The open world scenes are seen from mainly a top-down view, where the environment is seen from the above, but other assets as if they were seen from the ground. This is similar to the perspective of many earlier handheld console RPGs, such as the original 2D Pokémon games. The graphics in Wither are in 2D. 3D graphics were also considered, but due to no previous experience in 3D modelling, time constraints excluded this option.

The opening of the game implies to the player that the world consists of areas associated with different elements, and the type of enemies encountered are determined by which area the player is in – i.e., mainly fire-type enemies will be encountered in a fire area, and water-themed in a water area. The demo area will feature one grass-themed area where the player starts, and one fire themed area accessed after defeating a boss.

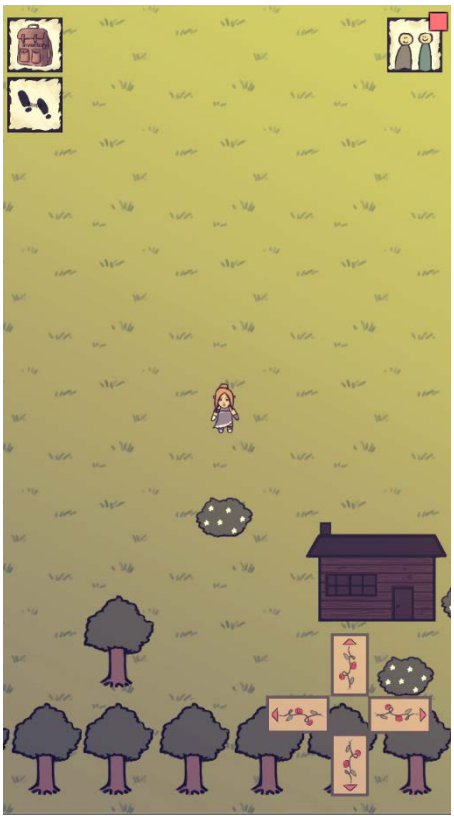

Figure 2: The starter area in the open world. The static UI elements consist of an inventory icon and icon for exercise mode in the upper left corner, multiplayer mode

icon in the upper right corner (which is indicating with red color that the player is offline), and arrows for movement in the lower right corner. The shrub seen near the player indicates an enemy node.

The player can move around in the open world areas by pressing on four arrow-like buttons on the right side of the screen. Enemies are represented by shrubs and trees, and when a player interacts with one containing an enemy, combat will be initiated. They are always static, and the player him-/herself is always the one who chooses whether to initiate or not. All enemies have a small chance to appear as giant versions of themselves, which increases their strength and health points, but also reward better items upon defeating them.

After a battle is won, the object interacted with will disappear from the game scene, and reappear only after the character leaves the area or restarts the game. One objective is to clear all enemies in an area, after which a stronger enemy, called a boss, will appear. Defeating the boss will give especially good rewards and advance the storyline.

5.5 Battling

The combat in Wither is turn-based, with the player battling against one to three enemies, chosen on random from the available enemies populating the current area. Enemy levels will be randomized within a certain range. Boss fights are an exception, as they have a pre-defined number of enemies spawned and fixed levels for consistent difficulty.

The only information about the enemy that the player is able to see is the enemy name, level, and how many per cents HP the enemy has left. Armor, strength, weaknesses and other factors are hidden for the player to discover along the battle.

The user has four skills at a time available for use, determined by the job the player has equipped. The demo version has four available jobs – a physical attacker, a magical attacker, a magical supporter and a magical specialist at weakening the enemy through other means than direct damage. The player can have two jobs equipped, but only one active at a time in battle, and are able to switch between the two at any time for a low energy cost. Essentially, this means that the player has a repertoire of eight skills to use during battle. Skills and jobs can be switched at any time outside of combat.

The player has energy – MP – that skills deplete when used. The player's turn either ends when all mana is spent, or if the player him- or herself passes the turn. Enemies only get one attack each, after which the player can attack again. Energy is replenished between turns, so the player starts each turn with full energy, or even more if some energy was left and the player passed the previous turn.

All attacks have an element – either physical, fire, water, earth or wind, and each enemy has its own resistances and weaknesses against certain elements, forcing the player to diversify their skills to be able to beat all opponents. If an enemy is too strong, the player is able to flee at any time, and can engage in battle unlimited times without penalty.

Figure 3: The battle scene. The selected enemy is indicated with brighter green color in its HP bar and a blue arrow under the enemy sprite. The selected enemy is also suffering from a debuff that the player has applied, indicated by the icon under the health bar.

All skills have their own animations for easier visual identification of which skill was used. Some skills can add buffs – effects that strengthen the player - on the user, or debuffs on the enemy, which will make the enemy weaker. Buffs and debuffs are shown on the

HP bar of the affected unit, with a number indicating how many turns the buff or debuff will affect the target.

5.6 Multiplayer

Wither is designed to support a multiplayer mode for two players. The multiplayer mode works as long as both clients are connected to the Internet.

The technical side of the multiplayer feature of Wither is carried out through a third party software, Photon (www.photonengine.com). Photon hosts a server for the game to connect to and provides ready-made solutions for connecting players to the same game.

The multiplayer mode allows players to see each move on the open world map, as well as fight together. The combat window is slightly altered to allow for a first-turn button, in which the one who first presses it will make the first move in that combat turn. After one player is finished, they will press the Pass button to switch over to the next player's turn, and the next player presses Pass again to switch to the enemy's turn. The First button appears after every enemy turn, to allow for more flexible coordination between players.

The game also offers a built-in chat function for players to easier communicate while in-game, to lessen the interruption of having to switch to another messaging application if players are not physically in the same location.

5.7 Engagement in Wither

Most of the features in Wither are implemented from the aspects identified in the literature study.

Since challenge and difficulty were the most important factors for enjoyment, I concluded that these had to be implemented in some way. Some studies found that a game should be easy in the beginning and gradually increase in difficulty, which made it difficult to implement proper difficult parts in the game due to the limited amount of content in the game in its current state. The challenge aspect was eventually implemented in the form of challenging end bosses.

After defeating all enemies in the starter area, a new enemy node will spawn, containing the end boss fight of the area. Defeating the end boss requires careful planning of which skills to use, as the boss is considerably stronger than normal enemies, uses skills that have to be countered, and employs different strategies depending on conditions such as how much HP it has left. In multiplayer, the boss is even more difficult in order to compensate for the fact that there are two players, meaning that the players really have to coordinate strategy with each other to beat the battle. Some of the mechanics the boss uses are already introduced in normal enemies, so that the player is slowly introduced to possible strategies for different situations and will be unknowingly training for the final battle. The player also receives generous rewards when beating the boss to make up for the effort and time spent, as well as access to the next area. After defeating the boss, the rest of the game is easier, consisting mostly of defeating regular enemy nodes in the new area that is unlocked. The second area culminates in another challenging boss fight. In this way I hope to have managed to make a somewhat down-up fashioned difficulty level.

An extra layer of difficulty was added into normal gameplay through the random appearance of giant enemies, which require extra effort to defeat, but also give better rewards than normal enemies. This was thought to be an especially important aspect in multiplayer mode, where normal battles will be much shorter than in single player due to two players attacking the enemies instead of one. To not make giant encounters too frustrating and tedious if the player just wants to quickly progress, the player is free to flee from the battle and reroll the encounter without any penalty.

Visuals were the second most mentioned factor, but due to limited time to develop the game, the visuals were not the strongest focus of the game. Color filters were used to try to create different moods for the different areas, with the starter area being in the middle of grassy plains where the sun is just setting, and the fire area being darker, with flame-colored details to create a charred effect for the entire area. The graphics drawn in a style that was within my own comfort zone and simplified somewhat, especially in the open world, to be able to draw all necessary assets within the time limit.

Control was implemented in the way that the open world areas do not have to be progressed in any specific way. The only way to complete the areas is to clear all enemy nodes, but this can be done in whichever order the player prefers to. The player's actions clearly and visually affect the game, as every defeated node is removed from the map,

and defeating the end boss of the first area moves the story forward and opens up a path to a new area – hopefully making the player feel like they had an impact on the world.

A multiplayer game mode was implemented after identifying social interaction as one of the most important factors. I have noted from personal experience that the social aspect of a game makes the experience even richer than when playing alone, which meant that the multiplayer option was a must-have for me.

Character customization was implemented in the way that the player could affect most aspect of their character's appearance. Gender was fixed due to limited time of drawing assets, but hair style, hair color and skin color could be chosen when creating the character. These aspects can later be changed if the player is dissatisfied or gets bored with their look. After character creation, the character can be customized with different armors and weapons, which affect both the character's strength and appearance. Weapons and armors can also be dyed to be whichever color the player wants.

The inclusion of a narrative component to Wither was a given due to the game being an RPG. The story tries not to be too invasive, by not playing cutscenes too often, and all NPCs in the game world are optional to talk to. Cutscenes can also be easily skipped if the player does not feel like watching them, or if they have already watched them before on another character.

The short-term goal of the game, which is to defeat every enemy in an area to reach the end boss fight, is introduced in dialogue as soon as the player enters the game, making the goal clear enough, and is easy enough to be achievable in a short time if the player wants to. After defeating the boss and reaching the second area, there are no clear short-term goals, as the point of the demo game was for the players to be able to play it through in an hour or two at most. For those who enjoyed the game, the second area offers slower progression and more long-term goals, such as trying to find better weapons and leveling up by defeating enemies. This is also a good time to test out exercise mode, as it is currently the most rewarding game modes in order to make exercise something to look forward to.

Some hidden bonuses were added to the starter area for those who like to explore and discover secrets instead of rushing forward to reach the end as quickly as possible. There

are two different places where the player could discover a hidden item by standing in a specific position and doing something specific.

6 SURVEY

6.1 Questionnaire

Two questionnaires were found which measure a player's emotions and experiences when playing a game, which were likely candidates to be used as a basis for my own survey. IJsselsteijn et al. (2013) have developed the Game Experience Questionnaire (GExQ) to measure the user's experience when playing a certain game. Similarly, Brockmyer et al. (2009) have developed the Game Engagement Questionnaire (GEnQ) for surveying player engagement when playing video games in general.

A study made by Norman (2013), which compares the two studies, was used as a basis to determine which questionnaire to use for this thesis.

The GExQ is well suitable to measure the experience of playing a specific game, but might have to be tailored to properly apply to different genres of games. The GEnQ then again measures in a larger scale how involved a player will be in games in general, and can be used to identify likelihood of violent tendencies as a result of playing video games.

As the GEnQ was mostly focused on how to predict the general level of engagement a player will experience when playing games, the GExQ was seen to be a better fit for this study. The GExQ does has its shortcomings, in that even though it has been used in several studies (Johnson 2014), it has not been evaluated or validated to be reliable, but was still seen to be a better fit for the kind of study this thesis aims to conduct.

The GExQ (see Appendix 1) consists of three parts, with an optional fourth. The main three parts of the questionnaire are to be answered by the player directly after the gaming session.

Each part of the questionnaire contains several questions that the player has to rate on a scale between 0 (not at all) to 4 (extremely) on how well they feel the statement reflects their feelings about the game.

The fourth part, which the player will fill in while they are still playing the game, usually at set intervals, has been left out of this study. The game is intended to be played from beginning to end in a fairly short time if rushing through the game is how the player

prefers to play games, which will make the filling in of a questionnaire tedious, and might break any potential state of flow that the player manages to achieve.

The first part is called the core module, and measures the following attributes:

- Competence: “I was good at it”.
- Sensory and Imaginative Immersion: “I was interested in the game’s story”, “It was aesthetically pleasing”
- Flow: “I forgot everything around me”, “I lost track of time”
- Tension/Annoyance: “I felt frustrated”
- Challenge: “I thought it was hard”, “I had to put a lot of effort into it”
- Negative affect: “It gave me a bad mood”, “I felt bored”
- Positive affect: “I thought it was fun”, “I felt happy”

The second part is the social module, and measures the following:

- Psychological Involvement – Empathy: “When the other(s) was(where) happy, I was happy”, “I found it enjoyable to be with others”
- Psychological Involvement – Negative Feelings: “I felt jealous about the others”
- Behavioural Involvement: “The other’s actions were dependent on my actions”

The third part is the post-game module, and measures the following:

- Positive Experience: “I felt energized”
- Negative Experience: “I felt guilty”, “I found it a waste of time”
- Tiredness: “I felt exhausted”
- Returning to Reality: “I felt disoriented”, “I had a sense that I had returned from a journey”

The survey was modified with some own questions to give more background information as well as some qualitative data of the player’s experience. The questions about the player’s background were:

- Age
- Gender
- Hours you have played the game

- Favorite game genre
- Hours spent playing games on a weekly average

The extra questions were:

- Name your top three aspects about the game from the following: Challenge/difficulty, Visuals, Control, Social interaction, Characters, Story, Goals, Adventure and exploration
- Did you feel like any features were missing from the game?
- Would you play this game in the future? Why/why not?
- How would you rate the overall experience of the game on a scale from 0 to 4?

6.2 Method

The survey was carried out on a group of twenty participants, ranging from ages 23-39. Five of the participants were female, while the rest were male. The participants were selected with the criteria that all have previous experience with RPGs.

In order to be able to play on their own phones, the participants were distributed the game beforehand to resolve any possible installation or optimization issues before the playtest itself was carried out. The participants were asked to pair up and spend as much time as they wanted on the game over the course of one day, although a minimum of one hour, and were instructed to fill in the questionnaire after they felt they had played enough. The longer time window allows the players to play in a way that feels natural to them – some might like playing in short bursts along the day, some like playing for several hours at a time with zero pause. The longer test time also allowed room for the willing to test out the exercise mode, as the minutes spent on the exercise mode were included in total playtime.

Due to conflicting schedules, not everyone was able to test the same day, but it was ensured that everyone had an available partner to play with in order to test the multiplayer mode of the game. All participants knew their gaming partners from before, making sure that they would feel more comfortable with the study. Playing the game with the partner did not require physical proximity, but all who played separately used some sort of communication to coordinate when to play the game.

The questions that the players answered were grouped and calculated averages of in accordance with IJsselstein et al.'s instructions to get the values for the previously listed measurements of the GExQ.

6.3 Results

SPSS was used to get the mean, standard deviation, minimum and maximum values for the values measured in the GExQ. Chronbach's alpha was also calculated for the GExQ, and one-way ANOVAs were calculated to find correlation between the background information of the respondents such as age and gender, and the GExQ measurements. All statistical results generated through SPSS can be found in Appendix 2.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
0,790	0,769

	Mean	Std. Deviation	Minimum	Maximum
Age	27,6	5,072	23	39
Hours played Wither	1,9	0,641	1	3
Hours spent on games on a weekly average	11,25	11,406	1	45
Overall experience of the game	2,8	0,696	1	4
Competence	3,2	0,268	2,6	3,6
Sensory and imaginative immersion	2,392	0,505	1,5	3,333
Flow	2,2	0,662	1,2	3
Tension/annoyance	0,3	0,373	0	1
Challenge	1,630	0,3511	0,6	2,4
Challenge (adjusted)	2,717	0,585	1	4
Negative affect	0,538	0,446	0	1,75
Positive affect	3,050	0,3887	2,4	3,8
Psychological involvement - empathy	2,875	0,411	1,667	3,667
Psychological involvement - negative feelings	1,260	0,244	0,8	1,8
Psychological involvement - negative feelings (adjusted)	0,15	0,202	0	0,667

Behavioural involvement	3,217	0,546	2	4
Positive experience	1,983	0,785	0,667	3
Negative experience	0,233	0,190	0	0,667
Tiredness	0,150	0,2856	0	1
Returning to reality	0,867	0,679	0	2,333

Figure 4 & 5: Cronbach's alpha, mean, standard deviation, minimum and maximum values for the GExQ values as well as some of the background values, rounded to three decimals.

Components included in two of the GExQ measurements were not applicable for Wither, due to which adjusted versions of the measurements were created to better reflect the opinions of the players.

The measurement Challenge included the questions "I felt pressured" and "I felt time pressure", which every player had rated 0 (not at all). The players had commented that these questions were not relevant for the game, because there was no time limit attached to any component of the game, and there were no features pressuring the player at any point. Players commented that they felt the game was challenging due to other reasons, such as the end bosses requiring careful coordination with their teammate. When the zero scores of the components "I felt pressured" and "I felt time pressure" were included in the average of the Challenge measurement, the average was lower than how players really experienced the game.

The score of the social measurement of Psychological involvement – negative feelings was also misleading due to containing the questions "I influenced the mood of the other" and "I was influenced by the other's mood". Players reported that they had felt the question was a neutral one when they answered it, not negative. Therefore, these two questions were left out of the average of the adjusted Psychological involvement – negative feeling.

All players played the minimum of one hour required, with two playing up to three hours. The overall reception of the game was positive, with the average rating being 2,8 on a scale from 0 to 4. The measurements of Competence, Positive affect and Behavioral involvement had means above 3. The lowest scores were in Tension/annoyance, Negative affect, the adjusted Psychological involvement – negative feeling, Negative experience and Tiredness, all of which were rated below 1.

In the open-ended questions, 9 respondents felt that they were not missing any features in Wither. Five wished for dungeons or raids, two wished for a player versus player mode and two wished for the option to play with more than two players. Other suggested features were loot trading, other adventure game modes, challenge mode, matchmaking, more content overall, high scores, speed run mode, pets, guilds and competitive game content.

Factor	Total ratings	Top 1	Top 2	Top 3
Challenge	13	8	5	0
Visuals	5	1	2	2
Control	3	0	2	1
Social	8	4	1	3
Characters	3	1	2	0
Story	4	3	0	1
Goals	14	3	5	6
Adventure	10	0	3	7

Figure 6: The number of ratings each factor got and for which position (1, 2 or 3).

Despite Goals having been rated the most often, Challenge/difficulty had the highest rating, ranked number one by eight participants and number two by five. Social interaction was the second most top rated feature, while goals and story were tied for third place. Adventure and exploration was the third most frequently rated, with 10 total ratings, but none of the respondents had rated it as their favorite feature. Characters and Control received the lowest total amount of ratings, of which Characters still received one first position rating.

Fourteen respondents stated that they would play the game again. Four answered “Maybe” and two responded that the game was not to their liking. Those who liked the game most often stated that the game was good as a whole, and could not pinpoint very specifically what made the game worth playing again. The most frequently mentioned reason for playing the game again was that they liked the combat. One mentioned liking the challenge, and one mentioned liking the story and characters. Of the “Maybe” respondents, one specified that their playing again depended on what kind of content would be added to the game in the future and one wanted the game to be available for PC.

For the ANOVAs, the participants were divided in groups by age, gender, favorite genre, hours spent playing games per week and hours played Wither.

		Sum of Squares	df	Mean Square	F	Sig.
Positive affect	**Between Groups**	0,641	1	0,641	5,173	0,035
	Within Groups	2,229	18	0,124		
Behavioural involvement	**Between Groups**	0,817	1	0,817	3,027	0,099
	Within Groups	4,856	18	0,270		
Sensory and imaginative immersion	**Between Groups**	0,634	1	0,634	2,707	0,117
	Within Groups	4,215	18	0,234		

		Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Positive affect	**23-39**	2,947	0,325	0,084	2,767	3,127	2,4	3,4
	30-39	3,360	0,434	0,194	2,822	3,898	2,8	3,8
Behavioural involvement	**23-39**	3,100	0,534	0,138	2,804	3,396	2,000	4,000
	30-39	3,567	0,465	0,208	2,989	4,145	3,000	4,000
Sensory and imaginative immersion	**23-39**	2,289	0,506	0,131	2,009	2,569	1,500	3,167
	30-39	2,700	0,398	0,178	2,206	3,194	2,333	3,333

Figure 7 & 8: The three most statistically significant measurements for the age groups.

Because the players were of a relatively narrow age gap, they were split into only two groups: age 23-29 (N = 15) and age 30-39 (N = 5). One statistically significant ($p < 0,05$) correlation was found in the Positive affect measurement, in which $p = 0,035$. The younger group had an average rating of 2,947 for Positive affect, whereas the older group had 3,360. Although Behavioral involvement did not score a significant p-value, it was the only other measurement coming even close with $p = 0,099$. The younger group had rated this measurement slightly lower than the older group, with 3,1 versus 3,567.

		Sum of Squares	df	Mean Square	F	Sig.
Positive affect	**Between Groups**	1,014	1	1,014	9,834	0,006
	Within Groups	1,856	18	0,103		
Overall experience	**Between Groups**	2,400	1	2,400	6,353	0,021

	Within Groups	6,800	18	0,378		
Psychological involvement - negative feelings	**Between Groups**	0,216	1	0,216	4,263	0,054
	Within Groups	0,912	18	0,051		
Sensory and imaginative immersion	**Between Groups**	0,778	1	0,778	3,442	0,080
	Within Groups	4,070	18	0,226		

		Mean	**Std. Deviation**	**Std. Error**	**95% Confidence Interval for Mean**		**Minimum**	**Maximum**
					Lower Bound	**Upper Bound**		
Positive affect	**Female**	3,440	0,297	0,133	3,072	3,808	3,0	3,8
	Male	2,920	0,328	0,085	2,738	3,102	2,4	3,6
Overall experience	**Female**	3,40	0,548	0,245	2,72	4,08	3	4
	Male	2,60	0,632	0,163	2,25	2,95	1	3
Psychological involvement - negative feelings	**Female**	1,440	0,261	0,117	1,116	1,764	1,2	1,8
	Male	1,200	0,214	0,055	1,082	1,318	0,8	1,6
Sensory and imaginative immersion	**Female**	2,733	0,560	0,251	2,038	3,429	2,0	3,3
	Male	2,278	0,448	0,116	2,029	2,526	1,5	3,0

Figure 9 & 10: The four most statistically significant measurements for the gender groups.

In the gender comparison, where the first group consisted of five females, and the second of fifteen males, two statistically significant correlations were found. Positive affect had a p-value of 0,006, while Overall experience had a p-value of 0,021. Both values were rated on average higher by women than men, with the Overall experience being 3,40 versus 2,60 and Positive affect being 3,44 versus 2,92. Psychological involvement – negative feelings (non-adjusted) is on the edge of significance with p = 0,054. The female group had rated the measurement slightly higher than the male one, at 1,44 versus 1,2.

		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Overall experience	**Between Groups**	6,333	5	1,267	6,186	0,003

	Within Groups	2,867	14	0,205		
Psychological involvement - empathy	**Between Groups**	1,992	5	0,398	4,562	0,011
	Within Groups	1,223	14	0,087		
Positive experience	**Between Groups**	6,659	5	1,332	3,686	0,024
	Within Groups	5,058	14	0,361		
Psychological involvement - negative feelings	**Between Groups**	0,635	5	0,127	3,607	0,026
	Within Groups	0,493	14	0,035		

		Mean	**Std. Deviation**	**Std. Error**	**95% Confidence Interval for Mean**		**Minimum**	**Maximum**
					Lower Bound	**Upper Bound**		
Overall experience	**MMORPG**	3,40	0,548	0,245	2,72	4,08	3	4
	RPG	3	0,000	0,000	3,00	3,00	3	3
	Adventure	2,67	0,577	0,333	1,23	4,10	2	3
	MMO	1,5	0,707	0,500	-4,85	7,85	1	2
	MOBA	2,5	0,707	0,500	-3,85	8,85	2	3
	FPS	2					2	2
Psychological involvement - empathy	**MMORPG**	3	0,167	0,075	2,793	3,207	2,833	3,167
	RPG	3,143	0,311	0,117	2,855	3,430	2,667	3,667
	Adventure	2,222	0,509	0,294	0,957	3,487	1,667	2,667
	MMO	2,667	0	0	2,667	2,667	2,667	2,667
	MOBA	2,750	0,118	0,083	1,691	3,809	2,667	2,833
	FPS	3					3	3
Positive experience	**MMORPG**	2,433	0,573	0,256	1,722	3,144	1,667	3,000
	RPG	2,429	0,552	0,208	1,918	2,939	1,5	3,0
	Adventure	1,611	0,948	0,547	-0,743	3,965	0,833	2,667
	MMO	0,917	0,354	0,250	-2,260	4,093	0,667	1,167
	MOBA	1,167	0	0	1,167	1,167	1,167	1,167
	FPS	1,5					1,5	1,5
Psychological involvement - negative feelings	**MMORPG**	1,360	0,1673	0,0748	1,152	1,568	1,2	1,6
	RPG	1,371	0,243	0,092	1,147	1,596	1,2	1,8
	Adventure	1,133	0,115	0,067	0,846	1,420	1,0	1,2
	MMO	0,8	0	0	0,8	0,8	0,8	0,8

	MOBA	1,2	0	0	1,2	1,2	1,2	1,2
	FPS	1,4					1,4	1,4

Figure 11 & 12: The four most statistically significant measurements for the favorite genre groups.

The favorite genres listed by the respondents were MMORPG (N = 5), RPG (N = 7), Adventure (N = 3), massively multiplayer online game of any genre (MMO, N = 2), multiplayer online battle arena (MOBA, N = 2) and first-person shooter (FPS, N = 1). Of these, statistical significance was found in Overall experience (P = 0,003), Psychological involvement – empathy (P = 0,011), Psychological involvement – negative feelings (non-adjusted) (P = 0,026) and Positive experience (P = 0,024). The ones who liked MMORPGs or RPGs the most rated all measurements higher than the ones who liked Adventure, MMO and MOBA. The ratings of the FPS group were split, with Positive experience and Overall experience being rated significantly lower than the MMORPG and RPG groups, and Psychological involvement – empathy and Psychological involvement – negative feelings being rated as high or higher than the MMORPG and RPG groups.

		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Negative experience	**Between Groups**	0,242	2	0,121	4,602	0,025
	Within Groups	0,447	17	0,026		
Positive affect	**Between Groups**	0,694	2	0,347	2,713	0,095
	Within Groups	2,176	17	0,128		

		Mean	**Std. Deviation**	**Std. Error**	**95% Confidence Interval for Mean**		**Minimum**	**Maximum**
					Lower Bound	**Upper Bound**		
Negative experience	**0-1 h**	0,352	0,130	0,043	0,252	0,452	0,167	0,667
	1-2 h	0,167	0,149	0,061	0,010	0,323	0	0,333
	2+ h	0,100	0,224	0,100	-0,178	0,378	0,	0,5
Positive affect	**0-1 h**	3,244	0,410	0,137	2,930	3,559	2,6	3,8
	1-2 h	2,967	0,345	0,141	2,605	3,328	2,4	3,4
	2+ h	2,800	0,245	0,110	2,496	3,104	2,4	3,0

Figure 13 & 14: The two most statistically significant measurements for the groups of time spent on games per week.

For hours spent per week playing video games, the participants were split into three groups: [0, 1] hours gaming per day (N = 9), (1, 2] hours gaming per day (N = 6) and (2, ∞] hours per day (N = 5). Due to the small number of participants, this was concluded to be a fitting division of the participants' gaming habits, with 0-1 being considered low amounts of time spent on games, 1-2h being average, and 2+ being high amounts of time, up to 45 hours. Statistical significance was found in the Negative experience measurement (P = 0,025), where the ones who played the least rated Negative experience the highest. Positive affect was the only other measurement coming even close to significance at P = 0,095, showing a very weak link between less playtime and higher Positive affect.

		Sum of Squares	df	Mean Square	F	Sig.
Competence	**Between Groups**	0,238	1	0,238	3,820	0,066
	Within Groups	1,122	18	0,062		

		Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Competence	**1-2 h**	3,271	0,243	0,065	3,131	3,412	2,8	3,6
	2+ h	3,033	0,266	0,189	2,754	3,312	2,6	3,2

Figure 15 & 16: The statistically most significant measurement for the groups of time spent playing Wither.

The final link studied was between time spent on Wither and the GExQ measurements. The total playtime was categorized into 1-2 hours (N = 14) and over 2 hours (N = 6). No statistical significances were found in these groups. The measurement of Competence was the closest to significance (P = 0,066), identifying a weak link between less playtime leading to higher ratings in Competence.

6.4 Conclusions

Overall, the game seemed to be satisfying to most players, concluded from the overall mean rating of 2,8, and the highest ratings being on positive or neutral aspects such as Competence, Positive affect and Behavioral involvement, and being low in the negative

aspects of Psychological involvement – negative feeling, Negative experience and Tiredness. The fact that fourteen out of twenty respondents would play the game again, with four additional respondents willing to play the game if certain conditions were met, suggests that the game has managed to awaken positive emotions in most of the players.

Overall experience seems to also have been slightly skewed by the fact that while all of the respondents enjoyed RPGs to some degree, it was not everyone's favorite genre. The Overall experience rating might have been higher if only players who favor MMORPG or RPG genres had been selected to participate.

The factors identified in the literature as the most important for engagement were implemented with varied success. Challenge, being the most frequently mentioned factor in the literature review, received an average rating among the players at 1,63, but reached an above average rating of 2,717 when adjusting the Challenge measurement to better fit Wither.

Feedback from the respondents after the survey revealed that the Challenge measurement was interpreted slightly differently by different people. Some who had rated Challenge low had meant that the overall level of challenge in the game was fairly low – which was intended, as the normal enemy node fights were supposed to be quick and easy – while some who had rated Challenge high had meant that the parts that were challenging were very challenging, not that they felt that the entire game was challenging. If the survey were to be conducted again, the question should be slightly modified so that all respondents interpret the question the same way. Competence, the measure identifying how skillful the player perceived him- or herself as, was interestingly lower the more the player spent playing Wither. One factor could be that players who were not as skillful needed longer time to finish the game, or had given up on beating the game and utilized the exercise mode more than the others to gain rewards.

Even so, because the overall rating of Competence was on the higher end, and Challenge was the most frequently top rated feature of the game, it seems that the game managed to keep the balance between player skill and difficulty on a satisfying level.

Visuals were measured as a component of the Sensory and imaginative immersion Component. The measurement as a whole received a slightly above average rating, and only the component "It was aesthetically pleasing" received a mean rating of 2,9,

indicating that players leaned toward liking the visuals of the game, or that they at least were not bothered by them. No one rated the "It was aesthetically pleasing" 0 and three even mentioned the visuals as one of their top three components. Because visuals are such a subjective element, it could be concluded that the visuals in Wither are implemented well enough, and a high rating will be difficult to attain due to differences in personal preferences.

Control was not directly measured by any of the GExQ measurements, but few rated Control as their favorite component of Wither. This could be partially due to Control being a slightly more abstract element, which could mean different to different players and thus make it unlikely for the players to rate it high. It could also be that control in Wither, or perhaps RPGs in general, is implemented in a way that players take for granted and do not recognize as an element that might not be present in all games. Or it could be that the players in the test group simply did not find it as important in RPGs as the literature indicates, or that Wither did not implement it in a satisfactory or noteworthy way.

Social interaction was the second most frequently rated as the most important element, which is quite logical considering the high number of respondents who prefer MMORPGs. Wither scored above average on the Psychological involvement – empathy scale, indicating that the social interaction part of Wither was implemented successfully. The negative feelings measurement rated slightly high at a mean of 1,2, but with the adjusted version the negative mean rating dropped to 0,15. This seems reasonable, because Wither was designed to try to be fair toward both players and did not include any competitive elements which might have raised the negative score.

In the list of players' favorite features, Characters ranked on a tied last place with Control, which could be expected, as the characters in Wither were not designed to be the most noticeable feature of the game. Character design was at least a partial success, as they reached the top three features for three respondents, indicating that some respondents found them likeable. There were no other questions measuring character likeability, meaning that it is hard to draw any other conclusions about the success or failure of character implementation.

The storyline was rated as the most liked feature by three respondents, and included as a part of the Sensory and imaginative immersion measurement through "I was interested in the game's story". The component received an above average rating of 2,8, telling that the player's enjoyed the story even if most did not rate it as their favorite component in the game. The minimum rating it received was a 1, indicating that the story itself or its deliverance could be improved, but because story preferences, like visuals, are subjective, it can be difficult to achieve a much higher rating.

Goals was rated by the most players as one of their top three features in Wither, demonstrating that the game most likely succeeded in presenting clear and achievable goals.

Adventure was the third most often rated as a top three favorite component. Adventure was part of the Sensory and imaginative immersion measurement through "I felt I could explore things", which received the slightly above average rating of 2,4. No one rated this aspect a full four, and the lowest score it received was 1, indicating that exploration could still see some improvement. The fact that the game is still at a demo stage and does not include the amount of explorable area a full game does could explain the low score it gained from some respondents, especially considering that most still liked the exploration in Wither enough to rate it as one of their top three components.

It was also discovered through the ANOVAs that some background factors could further affect player preferences and game enjoyment. The group of age 30-39 rated Positive Affect higher than the group of age 23-29, suggesting that older people would enjoy the type of game that Wither is more than younger people. It could be explained with the fact that Wither is not the technologically most advanced game, compared to the newest games in the market, and has a relatively slow pace, considering it does not have real-time combat and that combat happens in instances instead of the open world. It could be that older players like this concept more, as it is closer to old-school console games. It could also be a coincidence considering the low sample size.

Positive affect and Overall experience was rated higher by the female group than the male group. This could simply be due to coincidental personality differences, as the female group was quite a lot smaller than the male (five versus fifteen). It could also be that women are less hesitant to give high ratings to their experiences than males.

It comes as no surprise that those who generally prefer RPG or MMORPG games also rated Wither higher, as Wither then contained many of the elements that those people like in a game. The group which favored FPSs was the only one who came on par with the RPG/MMORPG group in certain questions, but this fluctuation is most likely due to pure coincidence, as there was only one person who had rated FPS as their favorite game.

Negative affect was the highest in the group of participants who played games the least amount weekly and lowest in those who played the most hours per week. One possible explanation is that those who do not have as much time for games overall also feel guiltier for spending time on video games, as they might feel they do not have time for gaming and should be spending their time on more productive activities.

It should be noted that the study was limited by a small sample (N = 20), which could skew the results. An attempt to compensate for the small sample size has been to include some qualitative questions in addition to the quantitative questions included in the GExQ. Further studying should be conducted with a larger sample size, to better account for randomness in personal preference and to better control for influencing background factors such as game genre preference.

6.5 Summary

Of the eight factors contributing to engagement identified in the literature review, none were implemented in an unsatisfactory way in Wither, according to player ratings. Challenge was implemented the most satisfactory way by players, receiving high ratings in different parts of the survey, while control and character showed having the most room for improvement, due to having been ranked the least often as the top three favorite features in the game.

Overall, the game could be seen to have achieved its goal of making the player feel positive experience while playing, due to the higher than average overall rating as well as high rating for positive effect on the player. There is still room for improvement to gain higher scores on the positive experience felt by the player after he or she has finished playing as well as to improve the other measurements such as Flow and Sensory and imaginative immersion.

7 DISCUSSION

The aim of this thesis was to study which factors make a game engaging, and in what way these factors could be implemented in an RPG game for mobile devices. All eight main factors identified from previous research were implemented in various ways into Wither, as well as some more minor factors which were not as strongly supported by literature.

Despite these factors not being identified for mobile RPG games specifically, it seems they did apply to this genre as well, according to the results of my survey. My implementation of all of these factors were enjoyed by the players to some degree, as all had been selected into some position of the players' top three features of Wither. Challenge and difficulty, being the most supported factors identified in previous studies, were the most strongly verified by this study as well, suggesting that these are elements that should be paid especially much attention to when designing games.

Although the high mean ratings in Overall score and Positive affect can most likely to an extent be explained by the implementation of the identified engagement factors, the study cannot conclude that the scores come from these factors alone. Further studies should be conducted with larger groups of participants as well as to determine more specifically what the players liked in the game. The Game Experience Questionnaire provided a good overall look at how the players experienced the game as a whole, and even though I added some own questions to get more explanation to the results, further research should put even more focus on gathering qualitative feedback about larger amounts of specific elements in the game. This study does also not identify how great a role the specific implementation of the engaging elements plays in the player's experience. More specifically, is the presence of the engaging elements enough to make a game engaging, or is it greatly dependent on the way they are incorporated.

Further research could also be conducted concerning engaging elements in mobile games specifically, to compare if there is any discernable difference between enjoyable elements in different consoles. Mobile devices – specifically mobile phones – will always be limited by a smaller screen size than what consoles can offer, as both PC screen size and TV screen size only keep increasing. This study was able to prove that more complex games such as RPGs can be designed with mobile device limitations in mind and still be found fun. Because Unity offers the ability to export a game for PCs as well, it would be

interesting to compare how players would find the mobile version compared to a PC version of the same game.

8 SWEDISH SUMMARY

8.1 Introduktion

Mitt intresse för videospel fick sin början tidigt genom Pokémon-spelen på GameBoy-konsolen. Det utvecklades senare till ett intresse för online RPG spel (MMORPG) på PC. Jag har redan en längre tid haft ambitionen att utveckla ett eget spel, men saknade färdigheter att göra det innan jag erhöll gedigna teoretiska kunskaper genom mina studier. Detta ledde till mitt val att utveckla ett mobilspel som en del av min avhandling.

8.2 Syfte

Syftet med min avhandling är att utveckla delar av ett mobilspel genom att utnyttja element som litteraturen identifierar som komponenter i engagerande och roliga spel. Avhandlingens syfte är att skapa ett RPG spel för mobilplattformar och undersöka om mer komplexa element från PC- och konsolspel kan tillämpas i den mobila miljön.

Litteraturstudiens syfte är att identifiera element som kan utnyttjas i spelutvecklingen. Den praktiska delen undersöker om det demospel som skapats innehåller de element som kännetecknar ett engagerande spel.

8.3 Forskningsfrågor

Jag har valt följande forskningsfrågor:

1. Vilka element ingår i ett engagerande RPG-videospel?

2. Hur kan dessa element tillämpas i ett mobilspel?

8.4 RPG-spel

Termen RPG-spel innefattar allmänt alla former av digitala och konventionella rollspel, men i denna avhandling syftar jag endast på videospelsgenren, om inte annat nämns.

8.5 Mobilspel

Mobilspel spelas på en bärbar apparat, såsom en mobiltelefon eller en pekplatta (Yamaguchi et al. 2017). Efter lanseringen av Apples iPhone började marknaden för mobilspel växa på allvar. Numera kan spelen utnyttja bland 3D-grafik, och utökning av lagringsutrymme möjliggör allt mer innehåll. Mobilapparaternas små skärmar utgör fortfarande en utmaning, men tvingar samtidigt utvecklare att hitta på innovativa lösningar för spel (Feijoo et al. 2012).

8.6 Engagemang i spel

Avhandlingens syfte är att utforska vilka element som bidrar till engagemang eller positiv upplevelse för spelare av RPG-spel. Därmed bör även definitionen av engagemang förtydligas.

Denna studie kommer att hänvisa till ordet engagemang som ett paraplybegrepp för en spelares positiva upplevelser, eftersom engagemang enligt diverse skribenter oftast innefattade en större helhet av olika känslor och tillstånd som bidrar till helheten.

8.7 Faktorer som bidrar till engagemang

Lazarro (2004) har undersökt helheten av faktorer som i kombination bidrar till att engagera en spelare.

Fyra element i ett spel ansågs vara viktiga för att en spelare ska njuta av ett spel. Framgångsrika spel innehåller åtminstone tre av de fyra identifierade komponenterna. Dessa fyra komponenter är:

- Inre upplevelse: Spelet får spelaren att känna positiva känslor.
- Svårt men roligt: Spelet erbjuder utmaningar som spelaren gillar, särskilt om de kräver strategi istället för tur.
- Enkelt men roligt: Spelaren känner sig fördjupad i spelet främst genom att spelet skapar rätt sorts atmosfär.

- Social upplevelse: Spelare vill oftast dela sina erfarenheter med andra.

8.8 Wither

Det mobilspel som jag har utvecklat för denna avhandling har arbetsnamnet ”Wither”. På grund av tidsbrist utvecklades endast de viktigaste delarna.

Spelet är programmerat i C# i spelutvecklingsplattformen Unity. Spelet utnyttjar en SQLite-databaslösning, som kopplas till Unity via en färdig lösning, SQLite4Unity3d, som Roberto Huertas har utvecklat. Spelet kan exporteras till olika plattformar, men har i första hand optimerats för iOS operativsystemet.

Wither utspelar sig i en fantasivärld där spelarens uppgift är att rädda världen från att vissna. Huvudpersonen är i enlighet med traditionella RPG-spel en älvlik varelse. Berättelsen framställs via serietidningsaktiga paneler.

Spelaren får erfarenhet genom att besegra olika fantasivarelser, vilket successivt leder till placering på en högre nivå. Ju högre nivå spelarens karaktär uppnår, desto starkare blir karaktären i strider.

I en strid attackerar spelaren och fienden turvis, och det finns högst tre fiender. Spelaren kan utnyttja magi och fysisk styrka för att besegra fienden. För att uppmuntra aktivitet får spelaren belöningar på basen av antal steg under spelets gång.

Wither innehåller även möjlighet att spela i par genom en teknisk mjukvaru- och serverlösning Photon. Flerspelarläget innebär att spelare ser varandra när de utforskar världen, och kan hjälpa varandra i strid.

8.9 Engagemang i Wither

Eftersom utmaning var det oftast nämnda elementet i litteraturundersökningen var det viktigt att få in det i Wither. Utmaningen implementerades genom att det första området som spelaren har möjlighet att utforska avslutas med en svår slutstrid.

Det visuella var det näst mest nämnda elementet. Färgfilter utnyttjas för att skapa olika stämningar i spelet, såsom en illusion av solnedgång i det första skogsområdet, och ett förkolnat intryck i det andra området.

Kontroll implementerades genom att målet är att besegra alla fiender i områdena. Detta kräver ingen förhandsbestämd strategi, och behöver inte ske i någon särskild ordning. Spelarens handlingar påverkar direkt spelvärldens visuella och funktionella aspekter.

Flerspelarläget implementerades eftersom så många studier lyfte fram vikten av den sociala aspekten. Att kunna modifiera spelarens karaktär lyftes även fram som ett viktigt element, men implementerades inte alltför brett i Wither på grund av tidsbrist. Berättelsescenerna visas inte alltför ofta, och det är enkelt att skippa dem om spelaren inte känner för att sätta sig in i berättelsen.

Det kortsiktiga målet i spelet är att besegra varje fiende för att komma fram till slutstriden, och sedan besegra slutfienden. Målet anvisas explicit i ett tidigt skede.

8.10 Enkäten

Spelarnas åsikter om spelet mättes genom IJsselstein et al:s (2013) spelupplevelsesenkät (Game Experience Questionnaire, GExQ).

Enkäten (se bilaga 1) består i denna studie av tre delar. Varje del av enkäten består av påståenden, där spelaren betygsätter hur bra påståendena stämmer på dem själva på en skala från 0 (inte alls) till 4 (extremt mycket).

Den första delen av enkäten mäter kompetens, inlevelse, flöde, spänning/irritation, utmaning, negativ påverkan och positiv påverkan. Den andra delen mäter empati, negativa känslor och beteendeengagemang. Den sista delen mäter positiv upplevelse, negativ upplevelse, trötthet och återvändandet till verkligheten.

Enkäten har utökats med en del egna frågor för att få mer bakgrundsinformation om spelarna samt kvantitativ data om deras upplevelser.

8.11 Metod

Enkäten besvarades av en testgrupp på tjugo personer, varierande från ålder 23 till 39. Fem av deltagarna var kvinnor, resten män. Deltagarna valdes med kriteriet att de har tidigare erfarenhet av RPG-spel.

Spelarna fick spelet på förhand för att kunna spela på sina egna mobiltelefoner, och delades i par för att kunna testa flerspelarmöjligheten.

8.12 Resultat och slutsatser

SPSS användes för att få medeltalen, standardavvikelsen, minimi- och maximivärdena för enkätens mätvärden, samt Chronbachs alpha och ANOVAn.

Två av de komponenter som mättes i enkäten kunde inte direkt tillämpas för Wither, så jag har inkluderat två justerade värden där jag har lämnat bort påståenden från beräkningarna. Den ena komponenten var utmaning och den andra negativa känslor.

Överlag togs spelet positivt emot, med ett medelvärde på 2,8 på helhetsvitsordet (skala 0 till 4). Högst poäng fick Wither i positiva eller neutrala komponenter såsom kompetens, positiv inverkan och beteendeinverkan. Lägsta medelpoängen tilldelades negativa komponenter såsom negativa känslor, negativ upplevelse och trötthet. Över hälften var villiga att spela spelet på nytt, och fyra skulle spela på nytt ifall vissa kriterier uppfylls. Detta syftar till att spelare i stort sett upplevde spelet som positivt.

Faktorerna för engagemang som identifierades i litteraturstudien implementerades med varierande framgång. Utmaning, som nämndes av flest källor, fick ett lågt medelvärde på 1,63, men uppgick till 2,717 när utmaningskomponenten justerades för att lämna bort de icke-relevanta påståendena.

Kompetens, dvs. hur bra spelaren ansåg sig vara på spelet, betygsattes lägre ju längre tid spelaren hade lagt ner på Wither. En tänkbar förklaring kunde vara att de spelare som var skickligare kom snabbare till slutet, eller att spelare som inte var lika skickliga gav upp snabbare och istället testade motionsläget en längre tid. Den tid som spenderades på motionsläget räknades med i totala speltiden.

Den visuella aspekten betygsattes som helhet just över medeltalet, och påståendet ”Den var estetiskt tillfredsställande” betygsattes 2,9, vilket i kombination med att påståendet inte betygsattes 0 av en enda deltagare visar att spelets visuella sida åtminstone inte uppfattades som distraherande eller störande.

Känslan av kontroll mättes inte direkt i Game Experience Questionnaire-enkäten, men få deltagare rangordnade kontroll som en favoritkomponent. Det låga resultatet kan kanske delvis förklaras med att kontroll kan kännas som ett alltför abstrakt element, och kan ha tolkats på olika sätt av olika deltagare.

Den sociala aspekten rangordnades av deltagarna som det näst viktigaste elementet, vilket är logiskt med tanke på att en stor del av spelarna hade MMORPG som favoritgenre. Wither fick över medeltal på empatiskalan, vilket indikerar att det sociala samspelet var implementerat på ett lyckat sätt. Negativa känslor betygsattes med ett medelvärde på 1,2, men med det justerade värdet som lämnar bort motsägelsefulla tolkningar blev värdet 0,15.

Bland spelarnas favoritelement hamnar karaktärer på en delad sista plats med kontroll, vilket kanske är väntat eftersom Withers karaktärer inte var planerade att vara de viktigaste elementen i spelet. Några deltagare hade inkluderat karaktärer bland deras tre främsta favoritelement.

Berättelsen listades som favoritelementet av tre deltagare, och fick medelvärdet 2,8. Mål hade listats av de flesta spelarna som ett av deras topp tre element, vilket indikerar att spelet högst sannolikt lyckades presentera tydliga och uppnåeliga mål. Äventyr och utforskning var det tredje oftast röstade favoritelementet i spelet. Komponenten fick medelvärdet 2,4 tack vare påståendet ”Det kändes som om jag kunde utforska saker”.

ANOVA-analysen visade att en del bakgrundsfaktorer kan ha påverkat deltagarnas preferenser och njutning av spelet. Åldersgruppen 30-39-åringar betygsatte positiv inverkan högre än åldersgruppen 23-29. Positiv inverkan och helhetsvitsordet betygsattes högre av kvinnorna än männen.

De som generellt tycker bäst om RPG-spel eller MMORPG-spel betygsatte Wither högre än de med en annan favoritgenre. Negativ inverkan var högst bland deltagare som spelar

spel minsta antalet timmar per vecka, och lägst bland de som spelar spel flest timmar per vecka.

Det bör även noteras att studien är begränsad av en liten urvalsstorlek (N = 20), vilket kan förvränga resultaten. Ett försök att kompensera för den mindre urvalsstorleken var att inkludera kvalitativa frågor i tillägg till GExQ:s kvantitativa påståenden. Framtida studier kunde utföras med större urvalsstorlek för att bättre kompensera för slumpen i personliga preferenser samt bättre kontrollera för bakgrundsfaktorer såsom favoritspelgenre.

8.13 Diskussion

Avhandlingens syfte var att undersöka vilka faktorer gör ett spel engagerande samt på vilket sätt dessa faktorer kunde implementeras i ett RPG-spel för mobila apparater. De viktigaste faktorerna i litteraturstudien implementerades på varierande sätt i Wither. Trots att dessa faktorer inte identifierades specifikt för RPG-spel verkar det som om de ändå kunde konverteras till RPG-kontext enligt de överlag positiva enkätresultaten. Utmaning och svårighetsgrad, som var de viktigaste faktorerna enligt litteraturstudien, blev även starkast verifierade i denna avhandlings studie.

IJsselstein et al:s enkät fungerar för att utvärdera hur spelare i stora drag gillar ett specifikt spel, men måste i fortsättningen justeras ifall man vill mäta mer specifika eller konkreta element i spelet. Denna studie kunde inte identifiera hur stor betydelse de olika elementen hade för helhetsintrycket, eller hur stor inverkan sättet som elementen hade implementerats på hade på upplevelsen.

Fortsatta studier kunde utföras med större deltagargrupper för att verifiera resultaten i denna studie, samt för att se på engagerande element specifikt i mobilspel, och hur mycket spelarnas preferenser skiljer sig från PC- och konsolspel.

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APPENDICES

Appendix 1 – The Game Experience Questionnaire

Age:
Gender:
Hours you played the game:
Favorite game genre:
Hours spent on a weekly average on games:

Answer these questions after you have finished playing the game.
Please indicate how you felt while playing the game for each of the items, on the following scale:

not at all	slightly	moderately	fairly	extremely
0	1	2	3	4

PART 1

1. I felt content
2. I felt skillful
3. I was interested in the game's story
4. I thought it was fun
5. I was fully occupied with the game
6. I felt happy
7. It gave me a bad mood
8. I thought about other things
9. I found it tiresome
10. I felt competent
11. I thought it was hard
12. It was aesthetically pleasing
13. I forgot everything around me
14. I felt good
15. I was good at it
16. I felt bored

17. I felt successful
18. I felt imaginative
19. I felt that I could explore things
20. I enjoyed it
21. I was fast at reaching the game's targets
22. I felt annoyed
23. I felt pressured
24. I felt irritable
25. I lost track of time
26. I felt challenged
27. I found it impressive
28. I was deeply concentrated in the game
29. I felt frustrated
30. It felt like a rich experience
31. I lost connection with the outside world
32. I felt time pressure
33. I had to put a lot of effort into it

PART 2

1. I empathized with the other
2. My actions depended on the other actions
3. The other's actions were dependent on my actions
4. I felt connected to the other
5. The other paid close attention to me
6. I paid close attention to the other
7. I felt jealous about the other
8. I found it enjoyable to be with the other
9. When I was happy, the other was happy
10. When the other was happy, I was happy
11. I influenced the mood of the other
12. I was influenced by the other moods
13. I admired the other
14. What the other did affected what I did
15. What I did affected what the other did
16. I felt revengeful
17. I felt schadenfreude (malicious delight)

PART 3

1. I felt revived
2. I felt bad
3. I found it hard to get back to reality
4. I felt guilty
5. It felt like a victory
6. I found it a waste of time
7. I felt energised
8. I felt satisfied
9. I felt disoriented
10. I felt exhausted
11. I felt that I could have done more useful things
12. I felt powerful
13. I felt weary
14. I felt regret
15. I felt ashamed
16. I felt proud
17. I had a sense that I had returned from a journey

OPEN-ENDED QUESTIONS

1. Name your top three aspects about the game from the following:
    1. Challenge/difficulty
    2. Visuals
    3. Control (I felt in control over the game/I felt like my actions impacted the game)
    4. Social interaction
    5. Characters
    6. Story
    7. Goals
    8. Adventure and exploration

(enter the number of the category)

1.

2.

3.

2. Did you feel like any features were missing from the game?

2. Would you play this game in the future? Why/why not?

4. How would you rate the overall experience of the game on a scale from 0 to 4
0 = did not like at all, 4 = loved it.

Appendix 2 – Full survey response statistics

Reliability Statistics	
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
0,790	0,769

Inter-Item Correlation Matrix																	
	Competence	Sensory and imaginative immersion	Flow	Tension/ annoyance	Challenge	Challenge (adjusted)	Negative affect	Positive affect	Psychological involvement - empathy	Psychological involvement - negative feelings	Psychological involvement - negative feelings (adjusted)	Behavioural involvement	Positive experience	Negative experience	Tiredness	Returning to reality	Overall experience
Competence	1	0,221	0,178	-0,281	0,000	0,000	-0,331	0,081	0,128	-0,065	-0,130	0,012	0,217	-0,448	-0,276	0,348	0,339
Sensory and imaginative immersion	0,221	1,000	0,535	-0,424	0,405	0,405	-0,526	0,717	0,670	0,312	-0,062	0,624	0,843	-0,210	0,088	0,612	0,809
Flow	0,178	0,535	1,000	-0,739	-0,072	-0,072	-0,570	0,156	0,174	-0,313	-0,342	0,189	0,503	-0,654	-0,334	0,617	0,320
Tension/annoyance	-0,281	-0,424	-0,739	1,000	0,088	0,088	0,587	-0,036	-0,143	0,332	0,536	0,037	-0,281	0,486	0,214	-0,388	-0,433

Challenge	0	0,405	-0,072	0,088	1,000	1,000	-0,276	0,498	0,756	0,322	-0,017	0,412	0,225	-0,005	0,320	0,003	0,112
Challenge(adjusted)	0	0,405	-0,072	0,088	1,000	1,000	-0,276	0,498	0,756	0,322	-0,017	0,412	0,225	-0,005	0,320	0,003	0,112
Negative affect	-0,331	-0,526	-0,570	0,587	-0,276	-0,276	1,000	-0,254	-0,391	-0,022	0,080	-0,233	-0,499	0,485	0,366	-0,533	-0,483
Positive affect	0,081	0,717	0,156	-0,036	0,498	0,498	-0,254	1,000	0,623	0,634	0,213	0,417	0,664	0,095	0,403	0,266	0,701
Psychological involvement - empathy	0,128	0,670	0,174	-0,143	0,756	0,756	-0,391	0,623	1,000	0,569	-0,044	0,595	0,595	-0,112	0,355	0,283	0,429
Psychological involvement - negative feelings	-0,065	0,312	-0,313	0,332	0,322	0,322	-0,022	0,634	0,569	1,000	0,521	0,372	0,409	0,212	0,469	0,115	0,447
Psychological involvement - negative feelings (adjusted)	-0,130	-0,062	-0,342	0,536	-0,017	-0,017	0,080	0,213	-0,044	0,521	1,000	0,008	-0,002	0,335	0,198	-0,145	0,100
Behavioural involvement	0,012	0,624	0,189	0,037	0,412	0,412	-0,233	0,417	0,595	0,372	0,008	1,000	0,690	-0,118	0,174	0,516	0,374
Positive experience	0,217	0,843	0,503	-0,281	0,225	0,225	-0,499	0,664	0,595	0,409	-0,002	0,690	1,000	-0,198	0,188	0,764	0,764
Negative experience	-0,448	-0,210	-0,654	0,486	-0,005	-0,005	0,485	0,095	-0,112	0,212	0,335	-0,118	-0,198	1,000	0,532	-0,516	-0,026
Tiredness	-0,276	0,088	-0,334	0,214	0,320	0,320	0,366	0,403	0,355	0,469	0,198	0,174	0,188	0,532	1,000	-0,299	0,159
Returning to reality	0,348	0,612	0,617	-0,388	0,003	0,003	-0,533	0,266	0,283	0,115	-0,145	0,516	0,764	-0,516	-0,299	1,000	0,572
Overall experience	0,339	0,809	0,320	-0,433	0,112	0,112	-0,483	0,701	0,429	0,447	0,100	0,374	0,764	-0,026	0,159	0,572	1,000

Descriptive Statistics

	Mean	Std. Deviation	Minimum	Maximum
Age	27,60	5,072	23	39
Hours played Wither	1,9	0,641	1,0	3,0
Hours spent on games on a weekly average	11,25	11,406	1	45
I felt content	2,90	0,553	2	4
I felt skillful	2,90	0,641	2	4
I was interested in the game's story	2,80	0,834	1	4
I thought it was fun	3,25	0,550	2	4
I was fully occupied with the game	2,70	0,470	2	3
I felt happy	3,05	0,605	2	4
It gave me a bad mood	0,00	0,000	0	0
I thought about other things	1,20	0,768	0	3

I found it tiresome	0,40	0,598	0	2
I felt competent	3,05	0,394	2	4
I thought it was hard	2,60	0,821	1	4
It was aesthetically pleasing	2,90	0,553	2	4
I forgot everything around me	1,95	0,887	0	3
I felt good	2,85	0,366	2	3
I was good at it	3,80	0,410	3	4
I felt bored	0,55	0,686	0	2
I felt successful	3,10	0,641	2	4
I felt imaginative	0,60	0,681	0	2
I felt that I could explore things	2,40	0,598	1	3
I enjoyed it	3,20	0,616	2	4
I was fast at reaching the game's targets	3,15	0,489	2	4
Ifelt annoyed	0,30	0,470	0	1
I felt pressured	0	0	0	0
I felt irritable	0,20	0,410	0	1
I lost track of time	2,10	0,912	0	3
I felt challenged	3,05	0,686	1	4
I found it impressive	2,90	0,718	2	4
I was deeply concentrated in the game	2,30	0,657	1	3
I felt frustrated	0,40	0,503	0	1
It felt like a rich experience	2,75	0,716	2	4
I lost connection with the outside world	1,95	1,050	0	3
I felt time pressure	0	0	0	0
I had to put a lot of effort into it	2,50	0,688	1	4
I empathized with the other	2,35	1,309	0	4
My actions depended on the other actions	3,10	0,641	2	4
The other's actions were dependent on my actions	3,10	0,641	2	4
I felt connected to the other	2,80	0,696	1	4
The other paid close attention to me	3,25	0,639	2	4
I paid close attention to the other	3,25	0,639	2	4
I felt jealous about the other	0,15	0,366	0	1
I found it enjoyable to be with the other	3,45	0,510	3	4
When I was happy, the other was happy	3,00	0,562	2	4
When the other was happy, I was happy	3,05	0,510	2	4
I influenced the mood of the other	2,95	0,510	2	4

I was influenced by the other's moods	2,90	0,553	2	4
I admired the other	2,45	0,826	1	4
What the other did affected what I did	3,30	0,657	2	4
What I did affected what the other did	3,30	0,571	2	4
I felt revengeful	0,00	0,000	0	0
I felt schadenfreude (malicious delight)	0,30	0,470	0	1
I felt revived	1,50	0,889	0	3
I felt bad	0,05	0,224	0	1
I found it hard to get back to reality	0,45	0,686	0	2
I felt guilty	0,15	0,489	0	2
It felt like a victory	2,50	0,761	1	4
I found it a waste of time	0,30	0,571	0	2
I felt energised	1,75	1,070	0	3
I felt satisfied	2,50	0,761	1	4
I felt disoriented	0,40	0,681	0	2
I felt exhausted	0,25	0,444	0	1
I felt that I could have done more useful things	0,90	0,852	0	2
I felt powerful	1,95	0,999	0	3
I felt weary	0,05	0,224	0	1
I felt regret	0	0	0	0
I felt ashamed	0	0	0	0
I felt proud	1,70	1,031	0	3
I had a sense that I had returned from a journey	1,75	0,967	0	3
Overall experience	2,80	0,696	1	4
Competence	3,200	0,2675	2,6	3,6
Sensory and imaginative immersion	2,392	0,505	1,5	3,333
Flow	2,2	0,662	1,2	3,0
Tension/annoyance	0,3	0,373	0,0	1,0
Challenge	1,630	0,3511	0,6	2,4
Challenge(adjusted)	2,717	0,585	1,0	4,0
Negative affect	0,538	0,446	0,00	1,75
Positive affect	3,050	0,389	2,4	3,8
Psychological involvement - empathy	2,875	0,411	1,667	3,667
Psychological involvement - negative feelings	1,260	0,244	0,8	1,8
Psychological involvement - negative feelings (adjusted)	0,15	0,202	0	0,667
Behavioural involvement	3,217	0,546	2	4
Positive experience	1,983	0,785	0,667	3
Negative experience	0,233	0,190	0	0,667
Tiredness	0,150	0,286	0	1
Returning to reality	0,867	0,679	0	2,333

ANOVA – gender groups						
		Sum of Squares	df	Mean Square	F	Sig.
Overall experience	Between Groups	2,400	1	2,400	6,353	0,021
	Within Groups	6,800	18	0,378		
	Total	9,200	19			
Competence	Between Groups	0,043	1	0,043	0,583	0,455
	Within Groups	1,317	18	0,073		
	Total	1,360	19			
Sensory and imaginative immersion	Between Groups	0,778	1	0,778	3,442	0,080
	Within Groups	4,070	18	0,226		
	Total	4,849	19			
Flow	Between Groups	0,171	1	0,171	0,377	0,547
	Within Groups	8,149	18	0,453		
	Total	8,320	19			
Tension/ annoyance	Between Groups	0,007	1	0,007	0,051	0,825
	Within Groups	2,637	18	0,147		
	Total	2,644	19			
Challenge	Between Groups	0,054	1	0,054	0,425	0,523
	Within Groups	2,288	18	0,127		
	Total	2,342	19			
Challenge (adjusted)	Between Groups	0,150	1	0,150	0,425	0,523
	Within Groups	6,356	18	0,353		
	Total	6,506	19			
Negative affect	Between Groups	0,009	1	0,009	0,045	0,835
	Within Groups	3,775	18	0,210		
	Total	3,784	19			
Positive affect	Between Groups	1,014	1	1,014	9,834	0,006
	Within Groups	1,856	18	0,103		
	Total	2,870	19			
Psychological involvement - empathy	Between Groups	0,245	1	0,245	1,484	0,239
	Within Groups	2,970	18	0,165		
	Total	3,215	19			
Psychological involvement - negative feelings	Between Groups	0,216	1	0,216	4,263	0,054
	Within Groups	0,912	18	0,051		

	Total	1,128	19			
Psychological involvement - negative feelings (adjusted)	Between Groups	0,091	1	0,091	2,397	0,139
	Within Groups	0,681	18	0,038		
	Total	0,772	19			
Behavioural involvement	Between Groups	0,091	1	0,091	0,293	0,595
	Within Groups	5,581	18	0,310		
	Total	5,672	19			
Positive experience	Between Groups	0,669	1	0,669	1,089	0,310
	Within Groups	11,048	18	0,614		
	Total	11,717	19			
Negative experience	Between Groups	0,000	1	0,000	0,000	1,000
	Within Groups	0,689	18	0,038		
	Total	0,689	19			
Tiredness	Between Groups	0,017	1	0,017	0,196	0,664
	Within Groups	1,533	18	0,085		
	Total	1,550	19			
Returning to reality	Between Groups	0,267	1	0,267	0,565	0,462
	Within Groups	8,489	18	0,472		
	Total	8,756	19			

Descriptives – gender groups

			Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
		N				Lower Bound	Upper Bound		
Overall experience	Female	5	3,40	0,548	0,245	2,72	4,08	3	4
	Male	15	2,60	0,632	0,163	2,25	2,95	1	3
	Total	20	2,80	0,696	0,156	2,47	3,13	1	4
Competence	Female	5	3,280	0,2280	0,1020	2,997	3,563	3,0	3,6
	Male	15	3,173	0,2815	0,0727	3,017	3,329	2,6	3,6
	Total	20	3,200	0,2675	0,0598	3,075	3,325	2,6	3,6
Sensory and imaginative immersion	Female	5	2,733	0,560	0,251	2,038	3,429	2,000	3,333
	Male	15	2,278	0,448	0,116	2,029	2,526	1,500	3,000
	Total	20	2,392	0,505	0,113	2,155	2,628	1,500	3,333
Flow	Female	5	2,360	0,623	0,279	1,587	3,133	1,400	3,000
	Male	15	2,147	0,686	0,177	1,767	2,527	1,200	3,000
	Total	20	2,200	0,662	0,148	1,890	2,510	1,200	3,000

Tension/ annoyance	Female	5	0,267	0,365	0,163	-0,187	0,720	0,000	0,667
	Male	15	0,311	0,388	0,100	0,096	0,526	0,000	1,000
	Total	20	0,300	0,373	0,083	0,125	0,475	0,000	1,000
Challenge	Female	5	1,720	0,415	0,185	1,205	2,235	1,400	2,400
	Male	15	1,600	0,338	0,087	1,413	1,787	0,600	2,000
	Total	20	1,630	0,351	0,079	1,466	1,794	0,600	2,400
Challenge (adjusted)	Female	5	2,867	0,691	0,309	2,008	3,725	2,333	4,000
	Male	15	2,667	0,563	0,145	2,355	2,979	1,000	3,333
	Total	20	2,717	0,585	0,131	2,443	2,991	1,000	4,000
Negative affect	Female	5	0,500	0,468	0,209	-0,081	1,081	0,000	1,000
	Male	15	0,550	0,455	0,118	0,298	0,802	0,250	1,750
	Total	20	0,538	0,446	0,100	0,329	0,746	0,000	1,750
Positive affect	Female	5	3,440	0,297	0,133	3,072	3,808	3,000	3,800
	Male	15	2,920	0,328	0,085	2,738	3,102	2,400	3,600
	Total	20	3,050	0,389	0,087	2,868	3,232	2,400	3,800
Psychological involvement - empathy	1.00	5	3,067	0,384	0,172	2,590	3,543	2,667	3,667
	2.00	15	2,811	0,412	0,106	2,583	3,040	1,667	3,333
	Total	20	2,875	0,411	0,092	2,682	3,068	1,667	3,667
Psychological involvement - negative feelings	Female	5	1,440	0,261	0,117	1,116	1,764	1,200	1,800
	Male	15	1,200	0,214	0,055	1,082	1,318	0,800	1,600
	Total	20	1,260	0,244	0,054	1,146	1,374	0,800	1,800
Psychological involvement - negative feelings (adjusted)	Female	5	0,267	0,279	0,125	-0,080	0,613	0,000	0,667
	Male	15	0,111	0,163	0,042	0,021	0,201	0,000	0,333
	Total	20	0,150	0,202	0,045	0,056	0,244	0,000	0,667
Behavioural involvement	Female	5	3,100	0,723	0,323	2,203	3,997	2,000	4,000
	Male	15	3,256	0,499	0,129	2,979	3,532	2,333	4,000
	Total	20	3,217	0,546	0,122	2,961	3,472	2,000	4,000
Positive experience	Female	5	2,300	0,681	0,305	1,454	3,146	1,500	3,000
	Male	15	1,878	0,810	0,209	1,429	2,327	0,667	3,000
	Total	20	1,983	0,785	0,176	1,616	2,351	0,667	3,000
Negative experience	Female	5	0,233	0,149	0,067	0,048	0,418	0,000	0,333
	Male	15	0,233	0,207	0,053	0,119	0,348	0,000	0,667
	Total	20	0,233	0,190	0,043	0,144	0,322	0,000	0,667
Tiredness	Female	5	0,200	0,274	0,122	-0,140	0,540	0,000	0,500
	Male	15	0,133	0,297	0,077	-0,031	0,298	0,000	1,000
	Total	20	0,150	0,286	0,064	0,016	0,284	0,000	1,000

Returning to reality	Female	5	1,067	0,435	0,194	0,527	1,606	0,667	1,667
	Male	15	0,800	0,743	0,192	0,388	1,212	0,000	2,333
	Total	20	0,867	0,679	0,152	0,549	1,184	0,000	2,333

ANOVA - age groups

		Sum of Squares	df	Mean Square	F	Sig.
Overall experience	Between Groups	0,267	1	0,267	0,537	0,473
	Within Groups	8,933	18	0,496		
	Total	9,200	19			
Competence	Between Groups	0,011	1	0,011	0,142	0,710
	Within Groups	1,349	18	0,075		
	Total	1,360	19			
Sensory and imaginative immersion	Between Groups	0,634	1	0,634	2,707	0,117
	Within Groups	4,215	18	0,234		
	Total	4,849	19			
Flow	Between Groups	0,171	1	0,171	0,377	0,547
	Within Groups	8,149	18	0,453		
	Total	8,320	19			
Tension/annoyance	Between Groups	0,007	1	0,007	0,051	0,825
	Within Groups	2,637	18	0,147		
	Total	2,644	19			
Challenge	Between Groups	0,294	1	0,294	2,584	0,125
	Within Groups	2,048	18	0,114		
	Total	2,342	19			
Challenge(adjusted)	Between Groups	0,817	1	0,817	2,584	0,125
	Within Groups	5,689	18	0,316		
	Total	6,506	19			
Negative affect	Between Groups	0,026	1	0,026	0,125	0,728
	Within Groups	3,758	18	0,209		
	Total	3,784	19			
Positive affect	Between Groups	0,641	1	0,641	5,173	0,035
	Within Groups	2,229	18	0,124		
	Total	2,870	19			
Psychological involvement - empathy	Between Groups	0,245	1	0,245	1,484	0,239
	Within Groups	2,970	18	0,165		
	Total	3,215	19			

Psychological involvement - negative feelings	Between Groups	0,024	1	0,024	0,391	0,539
	Within Groups	1,104	18	0,061		
	Total	1,128	19			
Psychological involvement - negative feelings (adjusted)	Between Groups	0,046	1	0,046	1,148	0,298
	Within Groups	0,726	18	0,040		
	Total	0,772	19			
Behavioural involvement	Between Groups	0,817	1	0,817	3,027	0,099
	Within Groups	4,856	18	0,270		
	Total	5,672	19			
Positive experience	Between Groups	0,417	1	0,417	0,664	0,426
	Within Groups	11,300	18	0,628		
	Total	11,717	19			
Negative experience	Between Groups	0,007	1	0,007	0,196	0,664
	Within Groups	0,681	18	0,038		
	Total	0,689	19			
Tiredness	Between Groups	0,017	1	0,017	0,196	0,664
	Within Groups	1,533	18	0,085		
	Total	1,550	19			
Returning to reality	Between Groups	0,030	1	0,030	0,061	0,808
	Within Groups	8,726	18	0,485		
	Total	8,756	19			

Descriptives - age groups

			Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
		N				Lower Bound	Upper Bound		
Overall experience	23-39	15	2,73	0,704	0,182	2,34	3,12	1	4
	30-39	5	3,00	0,707	0,316	2,12	3,88	2	4
	Total	20	2,80	0,696	0,156	2,47	3,13	1	4
Competence	23-39	15	3,187	0,2973	0,0768	3,022	3,351	2,6	3,6
	30-39	5	3,240	0,1673	0,0748	3,032	3,448	3,0	3,4
	Total	20	3,200	0,2675	0,0598	3,075	3,325	2,6	3,6

Sensory and imaginative immersion	23-39	15	2,289	0,506	0,131	2,009	2,569	1,5	3,167
	30-39	5	2,700	0,398	0,178	2,206	3,194	2,333	3,333
	Total	20	2,392	0,505	0,113	2,155	2,628	1,5	3,333
Flow	23-39	15	2,147	0,602	0,155	1,813	2,480	1,2	3
	30-39	5	2,360	0,876	0,392	1,272	3,448	1,4	3
	Total	20	2,200	0,662	0,148	1,890	2,510	1,2	3
Tension/ annoyance	23-39	15	0,311	0,388	0,100	0,096	0,526	0	1
	30-39	5	0,267	0,365	0,163	-0,187	0,720	0	0,667
	Total	20	0,300	0,373	0,083	0,125	0,475	0	1
Challenge	23-39	15	1,560	0,331	0,086	1,377	1,743	0,6	2
	30-39	5	1,840	0,358	0,160	1,396	2,284	1,4	2,4
	Total	20	1,630	0,351	0,079	1,466	1,794	0,6	2,4
Challenge (adjusted)	23-39	15	2,600	0,552	0,143	2,294	2,906	1	3,333
	30-39	5	3,067	0,596	0,267	2,326	3,807	2,333	4
	Total	20	2,717	0,585	0,131	2,443	2,991	1	4
Negative affect	23-39	15	0,517	0,477	0,123	0,253	0,781	0	1,750
	30-39	5	0,600	0,379	0,170	0,129	1,071	0,250	1
	Total	20	0,538	0,446	0,100	0,329	0,746	0	1,750
Positive affect	23-39	15	2,947	0,325	0,084	2,767	3,127	2,4	3,4
	30-39	5	3,360	0,434	0,194	2,822	3,898	2,8	3,8
	Total	20	3,050	0,389	0,087	2,868	3,232	2,4	3,8
Psychological involvement - empathy	23-39	15	2,811	0,398	0,103	2,591	3,031	1,667	3,167
	30-39	5	3,067	0,435	0,194	2,527	3,606	2,667	3,667
	Total	20	2,875	0,411	0,092	2,682	3,068	1,667	3,667
Psychological involvement - negative feelings	23-39	15	1,240	0,188	0,049	1,136	1,344	0,8	1,6
	30-39	5	1,320	0,390	0,174	0,836	1,804	0,8	1,8
	Total	20	1,260	0,244	0,054	1,146	1,374	0,8	1,8
Psychological involvement - negative feelings (adjusted)	23-39	15	0,178	0,213	0,055	0,060	0,296	0	0,667
	30-39	5	0,067	0,149	0,067	-0,118	0,252	0	0,333
	Total	20	0,150	0,202	0,045	0,056	0,244	0	0,667
Behavioural involvement	23-39	15	3,100	0,534	0,138	2,804	3,396	2	4
	30-39	5	3,567	0,465	0,208	2,989	4,145	3	4
	Total	20	3,217	0,546	0,122	2,961	3,472	2	4

Positive experience	23-39	15	1,900	0,809	0,209	1,452	2,348	0,667	3
	30-39	5	2,233	0,732	0,327	1,324	3,142	1,167	3
	Total	20	1,983	0,785	0,176	1,616	2,351	0,667	3
Negative experience	23-39	15	0,244	0,198	0,051	0,135	0,354	0	0,667
	30-39	5	0,200	0,183	0,082	-0,027	0,427	0	0,333
	Total	20	0,233	0,190	0,043	0,144	0,322	0	0,667
Tiredness	23-39	15	0,133	0,297	0,077	-0,031	0,298	0	1
	30-39	5	0,200	0,274	0,122	-0,140	0,540	0	0,5
	Total	20	0,150	0,286	0,064	0,016	0,284	0	1
Returning to reality	23-39	15	0,844	0,641	0,165	0,490	1,199	0	2,333
	30-39	5	0,933	0,863	0,386	-0,138	2,005	0	2
	Total	20	0,867	0,679	0,152	0,549	1,184	0	2,333

ANOVA - genre groups

		Sum of Squares	df	Mean Square	F	Sig.
Overall experience	Between Groups	6,333	5	1,267	6,186	0,003
	Within Groups	2,867	14	0,205		
	Total	9,200	19			
Competence	Between Groups	0,285	5	0,057	0,743	0,604
	Within Groups	1,075	14	0,077		
	Total	1,360	19			
Sensory and imaginative immersion	Between Groups	2,331	5	0,466	2,593	0,073
	Within Groups	2,517	14	0,180		
	Total	4,849	19			
Flow	Between Groups	1,791	5	0,358	0,768	0,588
	Within Groups	6,529	14	0,466		
	Total	8,320	19			
Tension/ annoyance	Between Groups	0,881	5	0,176	1,400	0,283
	Within Groups	1,763	14	0,126		
	Total	2,644	19			
Challenge	Between Groups	0,930	5	0,186	1,844	0,169
	Within Groups	1,412	14	0,101		
	Total	2,342	19			
Challenge (adjusted)	Between Groups	2,583	5	0,517	1,844	0,169
	Within Groups	3,922	14	0,280		
	Total	6,506	19			

Negative affect	Between Groups	1,229	5	0,246	1,347	0,302
	Within Groups	2,555	14	0,183		
	Total	3,784	19			
Positive affect	Between Groups	1,104	5	0,221	1,750	0,188
	Within Groups	1,766	14	0,126		
	Total	2,870	19			
Psychological involvement - empathy	Between Groups	1,992	5	0,398	4,562	0,011
	Within Groups	1,223	14	0,087		
	Total	3,215	19			
Psychological involvement - negative feelings	Between Groups	0,635	5	0,127	3,607	0,026
	Within Groups	0,493	14	0,035		
	Total	1,128	19			
Psychological involvement - negative feelings (adjusted)	Between Groups	0,228	5	0,046	1,175	0,369
	Within Groups	0,544	14	0,039		
	Total	0,772	19			
Behavioural involvement	Between Groups	1,505	5	0,301	1,011	0,447
	Within Groups	4,167	14	0,298		
	Total	5,672	19			
Positive experience	Between Groups	6,659	5	1,332	3,686	0,024
	Within Groups	5,058	14	0,361		
	Total	11,717	19			
Negative experience	Between Groups	0,028	5	0,006	0,118	0,986
	Within Groups	0,661	14	0,047		
	Total	0,689	19			
Tiredness	Between Groups	0,493	5	0,099	1,305	0,317
	Within Groups	1,057	14	0,076		
	Total	1,550	19			
Returning to reality	Between Groups	2,730	5	0,546	1,269	0,331
	Within Groups	6,025	14	0,430		
	Total	8,756	19			

Descriptives – genre groups									
			Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
		N				Lower Bound	Upper Bound		
Overall experience	MMORPG	5	3,40	0,548	0,245	2,72	4,08	3	4
	RPG	7	3,00	0,000	0,000	3,00	3,00	3	3
	Adventure	3	2,67	0,577	0,333	1,23	4,10	2	3
	MMO	2	1,50	0,707	0,500	-4,85	7,85	1	2
	MOBA	2	2,50	0,707	0,500	-3,85	8,85	2	3
	FPS	1	2,00					2	2
	Total	20	2,80	0,696	0,156	2,47	3,13	1	4
Competence	MMORPG	5	3,280	0,1095	0,0490	3,144	3,416	3,2	3,4
	RPG	7	3,200	0,3266	0,1234	2,898	3,502	2,6	3,6
	Adventure	3	3,267	0,4163	0,2404	2,232	4,301	2,8	3,6
	MMO	2	3,100	0,1414	0,1000	1,829	4,371	3,0	3,2
	MOBA	2	2,900	0,1414	0,1000	1,629	4,171	2,8	3,0
	FPS	1	3,400					3,4	3,4
	Total	20	3,200	0,2675	0,0598	3,075	3,325	2,6	3,6
Sensory and imaginative immersion	MMORPG	5	2,733	0,480	0,215	2,137	3,330	2,333	3,333
	RPG	7	2,619	0,329	0,124	2,314	2,924	2	3
	Adventure	3	2,000	0,441	0,255	0,905	3,095	1,500	2,333
	MMO	2	2,000	0,707	0,500	-4,353	8,353	1,500	2,500
	MOBA	2	2,000	0,236	0,167	-0,118	4,118	1,833	2,167
	FPS	1	1,833					1,833	1,833
	Total	20	2,392	0,505	0,113	2,155	2,628	1,500	3,333
Flow	1.00	5	2,480	0,540	0,242	1,809	3,151	1,600	3
	2.00	7	2,171	0,706	0,267	1,518	2,825	1,400	3
	3.00	3	1,933	0,945	0,546	-0,415	4,281	1,200	3
	4.00	2	2,500	0,707	0,500	-3,853	8,853	2	3
	5.00	2	2,200	0,283	0,200	-0,341	4,741	2	2,400
	6.00	1	1,200					1,200	1,200
	Total	20	2,200	0,662	0,148	1,890	2,510	1,200	3,000
Tension/ annoyance	MMORPG	5	0,133	0,298	0,133	-0,237	0,504	0	0,667
	RPG	7	0,333	0,333	0,126	0,025	0,642	0	0,667
	Adventure	3	0,444	0,509	0,294	-0,820	1,709	0	1
	MMO	2	0,333	0,471	0,333	-3,902	4,569	0	0,667
	MOBA	2	0,000	0,000	0,000	0,000	0,000	0	0
	FPS	1	1,000					1	1
	Total	20	0,300	0,373	0,083	0,125	0,475	0	1
Challenge	MMORPG	5	1,560	0,1673	0,0748	1,352	1,768	1,4	1,8
	RPG	7	1,800	0,3464	0,1309	1,480	2,120	1,4	2,4

	Adventure	3	1,200	0,5292	0,3055	-0,114	2,514	0,6	1,6
	MMO	2	1,700	0,1414	0,1000	0,429	2,971	1,6	1,8
	MOBA	2	1,600	0,0000	0,0000	1,600	1,600	1,6	1,6
	FPS	1	2,000					2,0	2,0
	Total	20	1,630	0,3511	0,0785	1,466	1,794	0,6	2,4
Challenge (adjusted)	MMORPG	5	2,600	0,279	0,125	2,254	2,946	2,333	3
	RPG	7	3,000	0,577	0,218	2,466	3,534	2,333	4
	Adventure	3	2,000	0,882	0,509	-0,191	4,191	1	2,667
	MMO	2	2,833	0,236	0,167	0,716	4,951	2,667	3
	MOBA	2	2,667	0,000	0,000	2,667	2,667	2,667	2,667
	FPS	1	3,333					3,333	3,333
	Total	20	2,717	0,585	0,131	2,443	2,991	1	4
Negative affect	MMORPG	5	0,2500	0,17678	0,07906	0,0305	0,4695	0	1
	RPG	7	0,6429	0,37796	0,14286	0,2933	0,9924	0,25	1,00
	Adventure	3	0,8333	0,80364	0,46398	-1,1630	2,8297	0,25	1,75
	MMO	2	0,8750	0,53033	0,37500	-3,8898	5,6398	0,50	1,25
	MOBA	2	0,2500	0,00000	0,00000	0,2500	0,2500	0,25	0,25
	FPS	1	0,2500					0,25	0,25
	Total	20	0,5375	0,44629	0,09979	0,3286	0,7464	0,00	1,75
Positive affect	MMORPG	5	3,240	0,4561	0,2040	2,674	3,806	2,6	3,8
	RPG	7	3,229	0,3147	0,1190	2,938	3,520	2,8	3,6
	Adventure	3	2,800	0,3464	0,2000	1,939	3,661	2,4	3,0
	MMO	2	2,600	0,2828	0,2000	0,059	5,141	2,4	2,8
	MOBA	2	2,900	0,1414	0,1000	1,629	4,171	2,8	3,0
	FPS	1	2,800					2,8	2,8
	Total	20	3,050	0,3887	0,0869	2,868	3,232	2,4	3,8
Psychological involvement - empathy	MMORPG	5	3,000	0,167	0,075	2,793	3,207	2,833	3,167
	RPG	7	3,143	0,311	0,117	2,855	3,430	2,667	3,667
	Adventure	3	2,222	0,509	0,294	0,957	3,487	1,667	2,667
	MMO	2	2,667	0,000	0,000	2,667	2,667	2,667	2,667
	MOBA	2	2,750	0,118	0,083	1,691	3,809	2,667	2,833
	FPS	1	3,000					3	3
	Total	20	2,875	0,411	0,092	2,682	3,068	1,667	3,667
Psychological involvement - negative feelings	MMORPG	5	1,360	0,1673	0,0748	1,152	1,568	1,2	1,6
	RPG	7	1,371	0,2430	0,0918	1,147	1,596	1,2	1,8
	Adventure	3	1,133	0,1155	0,0667	0,846	1,420	1,0	1,2
	MMO	2	0,800	0,0000	0,0000	0,800	0,800	0,8	0,8
	MOBA	2	1,200	0,0000	0,0000	1,200	1,200	1,2	1,2
	FPS	1	1,400					1,4	1,4
	Total	20	1,260	0,2437	0,0545	1,146	1,374	0,8	1,8

Psychological involvement - negative feelings (adjusted)	MMORPG	5	0,267	0,279	0,125	-0,080	0,613	0,000	0,667
	RPG	7	0,095	0,163	0,061	-0,055	0,246	0	0,333
	Adventure	3	0,222	0,192	0,111	-0,256	0,700	0	0,333
	MMO	2	0,000	0,000	0,000	0,000	0,000	0	0
	MOBA	2	0,000	0,000	0,000	0,000	0,000	0	0
	FPS	1	0,333					0,333	0,333
	Total	20	0,150	0,202	0,045	0,056	0,244	0	0,667
Behavioural involvement	MMORPG	5	3,167	0,167	0,075	2,960	3,374	3,000	3,333
	RPG	7	3,524	0,690	0,261	2,886	4,162	2	4
	Adventure	3	3,222	0,694	0,401	1,499	4,946	2,667	4
	MMO	2	2,917	0,118	0,083	1,858	3,976	2,833	3
	MOBA	2	2,667	0,471	0,333	-1,569	6,902	2,333	3
	FPS	1	3,000					3	3
	Total	20	3,217	0,546	0,122	2,961	3,472	2	4
Positive experience	MMORPG	5	2,433	0,573	0,256	1,722	3,144	1,667	3
	RPG	7	2,429	0,552	0,208	1,918	2,939	1,500	3
	Adventure	3	1,611	0,948	0,547	-0,743	3,965	0,833	2,667
	MMO	2	0,917	0,354	0,250	-2,260	4,093	0,667	1,167
	MOBA	2	1,167	0,000	0,000	1,167	1,167	1,167	1,167
	FPS	1	1,500					1,500	1,500
	Total	20	1,983	0,785	0,176	1,616	2,351	0,667	3
Negative experience	MMORPG	5	0,233	0,149	0,067	0,048	0,418	0	0,333
	RPG	7	0,214	0,249	0,094	-0,016	0,445	0	0,667
	Adventure	3	0,278	0,255	0,147	-0,355	0,910	0	0,500
	MMO	2	0,167	0,236	0,167	-1,951	2,284	0	0,333
	MOBA	2	0,250	0,118	0,083	-0,809	1,309	0,167	0,333
	FPS	1	0,333					0,333	0,333
	Total	20	0,233	0,190	0,043	0,144	0,322	0,000	0,667
Tiredness	MMORPG	5	0,100	0,2236	0,1000	-0,178	0,378	0	0,5
	RPG	7	0,357	0,3780	0,1429	0,008	0,707	0	1
	Adventure	3	0,000	0,0000	0,0000	0,000	0,000	0	0
	MMO	2	0,000	0,0000	0,0000	0,000	0,000	0	0
	MOBA	2	0,000	0,0000	0,0000	0,000	0,000	0	0
	FPS	1	0,000					0	0
	Total	20	0,150	0,2856	0,0639	0,016	0,284	0	1
Returning to reality	MMORPG	5	1,067	0,435	0,194	0,527	1,606	0,667	1,667
	RPG	7	1,095	0,787	0,297	0,368	1,823	0,333	2,333
	Adventure	3	1,000	0,882	0,509	-1,191	3,191	0,333	2
	MMO	2	0,000	0,000	0,000	0,000	0,000	0	0
	MOBA	2	0,333	0,000	0,000	0,333	0,333	0,333	0,333

	FPS	1	0,667					0,667	0,667
	Total	20	0,867	0,679	0,152	0,549	1,184	0	2,333

ANOVA - hours played per week						
		Sum of Squares	df	Mean Square	F	Sig.
Overall experience	Between Groups	1,611	2	0,806	1,805	0,195
	Within Groups	7,589	17	0,446		
	Total	9,200	19			
Competence	Between Groups	0,032	2	0,016	0,208	0,814
	Within Groups	1,328	17	0,078		
	Total	1,360	19			
Sensory and imaginative immersion	Between Groups	0,686	2	0,343	1,401	0,273
	Within Groups	4,163	17	0,245		
	Total	4,849	19			
Flow	Between Groups	1,611	2	0,806	2,041	0,161
	Within Groups	6,709	17	0,395		
	Total	8,320	19			
Tension/ annoyance	Between Groups	0,098	2	0,049	0,325	0,727
	Within Groups	2,547	17	0,150		
	Total	2,644	19			
Challenge	Between Groups	0,466	2	0,233	2,114	0,151
	Within Groups	1,876	17	0,110		
	Total	2,342	19			
Challenge (adjusted)	Between Groups	1,296	2	0,648	2,114	0,151
	Within Groups	5,210	17	0,306		
	Total	6,506	19			
Negative affect	Between Groups	0,032	2	0,016	0,073	0,930
	Within Groups	3,752	17	0,221		
	Total	3,784	19			
Positive affect	Between Groups	0,694	2	0,347	2,713	0,095
	Within Groups	2,176	17	0,128		
	Total	2,870	19			
Psychological involvement - empathy	Between Groups	0,614	2	0,307	2,008	0,165
	Within Groups	2,601	17	0,153		
	Total	3,215	19			

Psychological involvement - negative feelings	Between Groups	0,244	2	0,122	2,352	0,125
	Within Groups	0,884	17	0,052		
	Total	1,128	19			
Psychological involvement - negative feelings (adjusted)	Between Groups	0,091	2	0,045	1,132	0,346
	Within Groups	0,681	17	0,040		
	Total	0,772	19			
Behavioural involvement	Between Groups	1,091	2	0,546	2,024	0,163
	Within Groups	4,581	17	0,269		
	Total	5,672	19			
Positive experience	Between Groups	1,281	2	0,640	1,043	0,374
	Within Groups	10,436	17	0,614		
	Total	11,717	19			
Negative experience	Between Groups	0,242	2	0,121	4,602	0,025
	Within Groups	0,447	17	0,026		
	Total	0,689	19			
Tiredness	Between Groups	0,286	2	0,143	1,924	0,176
	Within Groups	1,264	17	0,074		
	Total	1,550	19			
Returning to reality	Between Groups	1,111	2	0,556	1,235	0,316
	Within Groups	7,644	17	0,450		
	Total	8,756	19			

Descriptives - hours played per week

			Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
		N				Lower Bound	Upper Bound		
Overall experience	0-1h	9	3,11	0,601	0,200	2,65	3,57	2	4
	1-2h	6	2,50	0,837	0,342	1,62	3,38	1	3
	2+	5	2,60	0,548	0,245	1,92	3,28	2	3
	Total	20	2,80	0,696	0,156	2,47	3,13	1	4
Competence	0-1h	9	3,244	0,2963	0,0988	3,017	3,472	2,6	3,6
	1-2h	6	3,167	0,2944	0,1202	2,858	3,476	2,8	3,6
	2+	5	3,160	0,2191	0,0980	2,888	3,432	2,8	3,4
	Total	20	3,200	0,2675	0,0598	3,075	3,325	2,6	3,6

Sensory and imaginative immersion	0-1h	9	2,574	0,472	0,157	2,211	2,937	1,833	3,333
	1-2h	6	2,139	0,510	0,208	1,604	2,674	1,500	3
	2+	5	2,367	0,519	0,232	1,722	3,011	1,500	2,833
	Total	20	2,392	0,505	0,113	2,155	2,628	1,500	3,333
Flow	0-1h	9	1,911	0,686	0,229	1,384	2,439	1,200	3
	1-2h	6	2,300	0,303	0,124	1,982	2,618	2,000	2,800
	2+	5	2,600	0,787	0,352	1,622	3,578	1,200	3
	Total	20	2,200	0,662	0,148	1,890	2,510	1,200	3
Tension/ annoyance	0-1h	9	0,370	0,389	0,130	0,071	0,669	0	1
	1-2h	6	0,278	0,328	0,134	-0,066	0,622	0	0,667
	2+	5	0,200	0,447	0,200	-0,355	0,755	0	1
	Total	20	0,300	0,373	0,083	0,125	0,475	0	1
Challenge	0-1h	9	1,778	0,3232	0,1077	1,529	2,026	1,4	2,4
	1-2h	6	1,600	0,1265	0,0516	1,467	1,733	1,4	1,8
	2+	5	1,400	0,4899	0,2191	0,792	2,008	0,6	1,8
	Total	20	1,630	0,3511	0,0785	1,466	1,794	0,6	2,4
Challenge (adjusted)	0-1h	9	2,963	0,539	0,180	2,549	3,377	2,333	4
	1-2h	6	2,667	0,211	0,086	2,445	2,888	2,333	3
	2+	5	2,333	0,816	0,365	1,320	3,347	1	3
	Total	20	2,717	0,585	0,131	2,443	2,991	1	4
Negative affect	0-1h	9	0,5000	0,35355	0,11785	0,2282	0,7718	0,00	1,00
	1-2h	6	0,5417	0,45871	0,18727	0,0603	1,0231	0,25	1,25
	2+	5	0,6000	0,65192	0,29155	-0,2095	1,4095	0,25	1,75
	Total	20	0,5375	0,44629	0,09979	0,3286	0,7464	0,00	1,75
Positive affect	0-1h	9	3,244	0,4096	0,1365	2,930	3,559	2,6	3,8
	1-2h	6	2,967	0,3445	0,1406	2,605	3,328	2,4	3,4
	2+	5	2,800	0,2449	0,1095	2,496	3,104	2,4	3,0
	Total	20	3,050	0,3887	0,0869	2,868	3,232	2,4	3,8
Psychological involvement - empathy	0-1h	9	3,056	0,363	0,121	2,776	3,335	2,333	3,667
	1-2h	6	2,806	0,195	0,080	2,601	3,010	2,667	3,167
	2+	5	2,633	0,582	0,260	1,911	3,356	1,667	3,167
	Total	20	2,875	0,411	0,092	2,682	3,068	1,667	3,667
Psychological involvement - negative feelings	0-1h	9	1,378	0,2333	0,0778	1,198	1,557	1,0	1,8
	1-2h	6	1,200	0,2530	0,1033	0,935	1,465	0,8	1,6
	2+	5	1,120	0,1789	0,0800	0,898	1,342	0,8	1,2
	Total	20	1,260	0,2437	0,0545	1,146	1,374	0,8	1,8

Psychological involvement - negative feelings (adjusted)	0-1h	9	0,222	0,167	0,056	0,094	0,350	0	0,333
	1-2h	6	0,111	0,272	0,111	-0,175	0,397	0	0,667
	2+	5	0,067	0,149	0,067	-0,118	0,252	0	0,333
	Total	20	0,150	0,202	0,045	0,056	0,244	0	0,667
Behavioural involvement	0-1h	9	3,352	0,358	0,119	3,077	3,627	3	4
	1-2h	6	2,861	0,687	0,280	2,141	3,582	2	4
	2+	5	3,400	0,548	0,245	2,720	4,080	2,667	4
	Total	20	3,217	0,546	0,122	2,961	3,472	2	4
Positive experience	0-1h	9	2,204	0,639	0,213	1,713	2,695	1,333	3
	1-2h	6	1,611	0,841	0,343	0,728	2,494	0,667	3
	2+	5	2,033	0,953	0,426	0,850	3,217	0,833	2,833
	Total	20	1,983	0,785	0,176	1,616	2,351	0,667	3
Negative experience	0-1h	9	0,352	0,130	0,043	0,252	0,452	0,167	0,667
	1-2h	6	0,167	0,149	0,061	0,010	0,323	0	0,333
	2+	5	0,100	0,224	0,100	-0,178	0,378	0	0,500
	Total	20	0,233	0,190	0,043	0,144	0,322	0	0,667
Tiredness	0-1h	9	0,278	0,3632	0,1211	-0,001	0,557	0	1
	1-2h	6	0,083	0,2041	0,0833	-0,131	0,298	0	0,5
	2+	5	0,000	0,0000	0,0000	0,000	0,000	0	0
	Total	20	0,150	0,2856	0,0639	0,016	0,284	0	1
Returning to reality	0-1h	9	0,778	0,441	0,147	0,439	1,117	0,333	1,667
	1-2h	6	0,667	0,596	0,243	0,041	1,292	0	1,667
	2+	5	1,267	1,038	0,464	-0,022	2,556	0	2,333
	Total	20	0,867	0,679	0,152	0,549	1,184	0	2,333

ANOVA - hours played Wither

		Sum of Squares	df	Mean Square	F	Sig.
Overall experience	Between Groups	0,343	1	0,343	0,697	0,415
	Within Groups	8,857	18	0,492		
	Total	9,200	19			
Competence	Between Groups	0,238	1	0,238	3,820	0,066
	Within Groups	1,122	18	0,062		
	Total	1,360	19			
Sensory and imaginative immersion	Between Groups	0,159	1	0,159	0,609	0,445

	Within Groups	4,690	18	0,261		
	Total	4,849	19			
Flow	Between Groups	0,152	1	0,152	0,336	0,569
	Within Groups	8,168	18	0,454		
	Total	8,320	19			
Tension/ annoyance	Between Groups	0,068	1	0,068	0,473	0,500
	Within Groups	2,577	18	0,143		
	Total	2,644	19			
Challenge	Between Groups	0,080	1	0,080	0,637	0,435
	Within Groups	2,262	18	0,126		
	Total	2,342	19			
Challenge (adjusted)	Between Groups	0,222	1	0,222	0,637	0,435
	Within Groups	6,283	18	0,349		
	Total	6,506	19			
Negative affect	Between Groups	0,018	1	0,018	0,086	0,773
	Within Groups	3,766	18	0,209		
	Total	3,784	19			
Positive affect	Between Groups	0,060	1	0,060	0,381	0,545
	Within Groups	2,810	18	0,156		
	Total	2,870	19			
Psychological involvement - empathy	Between Groups	0,081	1	0,081	0,465	0,504
	Within Groups	3,134	18	0,174		
	Total	3,215	19			
Psychological involvement - negative feelings	Between Groups	0,014	1	0,014	0,222	0,644
	Within Groups	1,114	18	0,062		
	Total	1,128	19			
Psychological involvement - negative feelings (adjusted)	Between Groups	0,045	1	0,045	1,106	0,307
	Within Groups	0,728	18	0,040		
	Total	0,772	19			
Behavioural involvement	Between Groups	0,068	1	0,068	0,218	0,647

	Within Groups	5,604	18	0,311		
	Total	5,672	19			
Positive experience	Between Groups	1,223	1	1,223	2,098	0,165
	Within Groups	10,493	18	0,583		
	Total	11,717	19			
Negative experience	Between Groups	0,002	1	0,002	0,062	0,806
	Within Groups	0,687	18	0,038		
	Total	0,689	19			
Tiredness	Between Groups	0,002	1	0,002	0,028	0,870
	Within Groups	1,548	18	0,086		
	Total	1,550	19			
Returning to reality	Between Groups	1,084	1	1,084	2,542	0,128
	Within Groups	7,672	18	0,426		
	Total	8,756	19			

Descriptives - hours played Wither

			Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
		N				Lower Bound	Upper Bound		
Overall experience	1-2h	14	2,71	0,726	0,194	2,29	3,13	1	4
	2+ h	6	3,00	0,632	0,258	2,34	3,66	2	4
	Total	20	2,80	0,696	0,156	2,47	3,13	1	4
Competence	1-2h	14	3,271	0,2431	0,0650	3,131	3,412	2,8	3,6
	2+ h	6	3,033	0,2658	0,1085	2,754	3,312	2,6	3,2
	Total	20	3,200	0,2675	0,0598	3,075	3,325	2,6	3,6
Sensory and imaginative immersion	1-2h	14	2,333	0,467	0,125	2,064	2,603	1,500	3,167
	2+ h	6	2,528	0,609	0,249	1,888	3,167	1,500	3,333
	Total	20	2,392	0,505	0,113	2,155	2,628	1,500	3,333
Flow	1-2h	14	2,143	0,635	0,170	1,776	2,509	1,200	3
	2+ h	6	2,333	0,766	0,313	1,530	3,137	1,200	3
	Total	20	2,200	0,662	0,148	1,890	2,510	1,200	3
Tension/ annoyance	1-2h	14	0,262	0,350	0,094	0,060	0,464	0	1
	2+ h	6	0,389	0,443	0,181	-0,076	0,854	0	1
	Total	20	0,300	0,373	0,083	0,125	0,475	0	1
Challenge	1-2h	14	1,671	0,2785	0,0744	1,511	1,832	1,4	2,4
	2+ h	6	1,533	0,5007	0,2044	1,008	2,059	0,6	2

	Total	20	1,630	0,3511	0,0785	1,466	1,794	0,6	2,4
Challenge (adjusted)	1-2h	14	2,786	0,464	0,124	2,518	3,054	2,333	4
	2+ h	6	2,556	0,834	0,341	1,680	3,431	1	3,333
	Total	20	2,717	0,585	0,131	2,443	2,991	1	4
Negative affect	1-2h	14	0,5179	0,38561	0,10306	0,2952	0,7405	0,00	1,25
	2+ h	6	0,5833	0,60553	0,24721	-0,0521	1,2188	0,25	1,75
	Total	20	0,5375	0,44629	0,09979	0,3286	0,7464	0,00	1,75
Positive affect	1-2h	14	3,014	0,3461	0,0925	2,814	3,214	2,4	3,6
	2+ h	6	3,133	0,5007	0,2044	2,608	3,659	2,4	3,8
	Total	20	3,050	0,3887	0,0869	2,868	3,232	2,4	3,8
Psychological involvement - empathy	1-2h	14	2,917	0,351	0,094	2,714	3,119	2,333	3,667
	2+ h	6	2,778	0,554	0,226	2,196	3,360	1,667	3,167
	Total	20	2,875	0,411	0,092	2,682	3,068	1,667	3,667
Psychological involvement - negative feelings	1-2h	14	1,243	0,2738	0,0732	1,085	1,401	0,8	1,8
	2+ h	6	1,300	0,1673	0,0683	1,124	1,476	1,2	1,6
	Total	20	1,260	0,2437	0,0545	1,146	1,374	0,8	1,8
Psychological involvement - negative feelings (adjusted)	1-2h	14	0,119	0,166	0,044	0,023	0,215	0,000	0,333
	2+ h	6	0,222	0,272	0,111	-0,063	0,508	0	0,667
	Total	20	0,150	0,202	0,045	0,056	0,244	0	0,667
Behavioural involvement	1-2h	14	3,179	0,601	0,161	2,832	3,525	2	4
	2+ h	6	3,306	0,427	0,174	2,857	3,754	2,667	3,667
	Total	20	3,217	0,546	0,122	2,961	3,472	2	4
Positive experience	1-2h	14	1,821	0,750	0,200	1,389	2,254	0,667	3
	2+ h	6	2,361	0,799	0,326	1,523	3,199	0,833	3
	Total	20	1,983	0,785	0,176	1,616	2,351	0,667	3
Negative experience	1-2h	14	0,226	0,140	0,038	0,145	0,307	0	0,333
	2+ h	6	0,250	0,293	0,120	-0,058	0,558	0	0,667
	Total	20	0,233	0,190	0,043	0,144	0,322	0	0,667
Tiredness	1-2h	14	0,143	0,2344	0,0626	0,008	0,278	0	0,5
	2+ h	6	0,167	0,4082	0,1667	-0,262	0,595	0	1
	Total	20	0,150	0,2856	0,0639	0,016	0,284	0	1
Returning to reality	1-2h	14	0,714	0,583	0,156	0,378	1,051	0	2
	2+ h	6	1,222	0,807	0,330	0,375	2,070	0,333	2,333
	Total	20	0,867	0,679	0,152	0,549	1,184	0	2,333